

# The Chemical Age

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## Industrial Safety

THE Report of the Chief Inspector of Factories which was summarised in THE CHEMICAL AGE last week contains the distressing statement that during 1936 the total number of industrial accidents increased by 18 per cent. and the fatal accidents by 9 per cent. over the corresponding figures for the previous year. It must be admitted that there has been an abnormal increase of accidents in places where such industries as steel, iron, heavy engineering and shipbuilding have begun to work at high pressure, and that additional risks were imported during the extensive reorganisations and installations of new plant. We must also admit that the number of people in employment has increased substantially during that period, and what may be even more apposite, the hours worked per person employed has also increased, so that the increase in accidents is not surprising. Nevertheless, the statistics show that an accident occurred to approximately one person in every 30 employed—and that is far too high to be pleasant, or to be regarded with equanimity.

There is even less cause for complacency when the Inspector can say in his Report that "too often immediate production is the main, if not the only, consideration, with the result that the question of safeguarding is left to the last and machines are put into use before proper fencing has been provided." From the point of view of accident prevention it is unwise to draw any distinction between fatal and non-fatal accidents. Admittedly the fatal accident makes the greater impression on those who behold it or who read about it, but it is often purely fortuitous whether an industrial mishap turns out to be fatal or otherwise; by a hair's breadth an accident may result in a scratch or a mortal wound. It is thus necessary to consider the total accidents rather than the much smaller number of fatal accidents.

In analysing the figures, a distinction should be drawn between accidents to young workers (in which term should be included those without experience) and those affecting the older and more experienced men. Unquestionably, a boy or young man entering industry for the first time, or a man newly engaged in an industry quite different from any in which he has had prior experience, is peculiarly liable to make mistakes that may have the most serious consequences. It is peculiarly necessary that young and inexperienced persons should receive the most careful instruction before being allowed to work in factories where they can be subjected to any danger. The Chief Inspector has noted a number of accidents to juveniles due to operating badly guarded machinery after only a few minutes "so-called instruction." Some factories have a regular system of employee training, and it

would be well if this practice could become general.

During the year 1936 the chemical industry, which also includes artificial manures, coal tar and paints, colours and varnish manufacture, suffered 3,958 accidents, of which 279 were due to machinery moved by mechanical power, 123 to transport, 18 to electricity, 45 to machinery not moved by mechanical power, 253 to stepping on or striking against objects, and 284 to the use of hand tools (these last two categories are not generally dangerous accidents and none was fatal in the chemical industry)—a total of 1,002 accidents (25 per cent.) of the kind that might occur in any industry and would not have special incidence in chemical works. The last two categories, comprising more than half the "general accidents" must have been almost wholly due to personal carelessness. A type of accident due often to carelessness, but naturally more prevalent where much of the plant is above ground level, is that due to being struck by a falling body; the chemical industry suffered 454 (4 fatal) accidents from this cause, a total of 11.5 per cent. We have thus accounted for just over 36 per cent. of the total accidents in the chemical industry as being due to causes not peculiar to that industry.

Coming to the category of accidents to which the chemical industry may be considered particularly prone, it will be found that 106 accidents (7 fatal) or 2.7 per cent. were due to explosions or fires, and 469 accidents (4 fatal) or 11.8 per cent. to contact with hot or corrosive substances. By far the two most important categories, however, are (a) "Persons falling," 714 accidents (9 fatal), comprising 18 per cent. of the total and (b) handling goods, 909 accidents (none fatal) comprising 22.8 per cent. The remaining accidents are classed as miscellaneous and therefore cannot be analysed. The accidents due to falling are natural in works comprising plant such as is to be found in chemical factories, but the number suggests that everything possible has not yet been done in the way of safety devices, non-slip treads, railings, and so forth.

It is difficult to see how the chemical industry can take steps to minimise many of the accidents caused by handling chemicals, but in this category there will be a high proportion that would not become accidents if the workmen exercised due care and if proper measures were enforced for cleanliness. It must not be forgotten in considering this important subject of accidents, that however much care the management may exercise, however many safety rules and devices may be initiated, ultimately accidents are very frequently caused by neglect of safety precautions by the workmen themselves. Education in safety is no less necessary for the workpeople than for employers and foremen.

## Notes and Comments

### Progress in the Dyestuffs Industry

**A**T the annual meeting of the Colour Users' Association held on Friday of last week, Sir Henry Sutcliffe Smith, chairman, reviewed the work of the association during the past year and the progress and development of the dyemaking industry in this country. The advance of the industry under the protection of the Dyestuffs Prohibition Act has been remarkable, especially when it is realised that the production has increased by 511 per cent. from 1913 to 1936. As compared with 1935, the largest increase in output is in the Direct Cotton Group, which is due to the largely increased trade in all forms of viscose rayon. The development of the rayon industry is also reflected in the increased output of dyestuffs for acetate silk. Although imports still maintain a high level, due mainly to the introduction of new and improved types of dyewares by the foreign manufacturers and partly to the improvement in trade of the colour using industries, a number of dyestuffs were manufactured in this country for the first time during the past year, and the volume of imports displaced thereby amounted to nearly 500,000 lb. The Association, in watching, protecting and promoting the general interests of all users of dyes and assisting in the promotion and development of the home dyemaking industry, is performing a most valuable function.

### Belgian Trade Plan

**I**N a letter to his Prime Minister, King Leopold set out a proposal for the establishment of a permanent institution to study the problems of the distribution of raw materials, distribution of the means of exchange, international distribution of labour and equilibrium between the agricultural and industrial nations; economic problems which are of the most serious nature to-day. It was stated that the institution contemplated ought to be as independent as possible of national influences and it is essential that it should be able to rely on the co-operation of those persons all over the world who are best acquainted with all questions relating to industry, trade, agriculture, finance and labour. The proposal has met with widespread interest and has been generally praised as a constructive step towards world recovery and the promotion of peace. It seems, however, that the successful operation of the plan would depend almost entirely on the successful divorce of politics from economics, a most difficult task, and the adequate representation of technicians on the institution investigating the problems, many of which profoundly affect the chemical trade. The scheme, which at the moment has only been put forward tentatively, deserves the deepest consideration.

### Statutory Rules and Orders

**S**TATUTORY Rules and Orders are drafted by the Home Office, as and when occasion arises, for the purpose of showing what is either prohibited or permissible under an Act of Parliament, so far as that Act affects some particular phase of industry and trade. That those who have to comply with the law—or suffer the consequences—may be assisted, it is therefore desirable that any such Rules and Orders be

worded in a manner which is not liable to be misunderstood. The new draft amendments to the Poisons Rules and Orders, made under the Pharmacy and Poisons Act, 1933, have just been published by H.M. Stationery Office as two separate leaflets. In their present form, probably 90 per cent. of the people to whom these Rules and Orders will ultimately apply cannot correctly interpret their meaning. Referring to the Third Schedule of the Rules it is stated that "in Group II, first column, in the item 'Phenylene diamines; toluene diamines; their salts' after the words 'toluene diamines' there shall be inserted the words 'other alkylated-benzene diamines'"; and that "the poisons and substances or articles set out in Schedule A hereto shall be included in Group II in the same manner as if Schedule A hereto formed part of Group II." Schedule A, referred to above, includes a reference to salts of barium, dinitrophenols, oxalic acid, metallic oxalates, and sodium ethyl mercurithiosalicylate. The Amendments refer to "Schedule B," which includes metallic oxalates other than potassium quadroxalate.

### Germany's Iron Shortage

**I**N view of the national campaign for collecting scrap iron which has been initiated in this country owing to the increased demands for steel, an interesting comparison can be drawn with the measures adopted in Germany to combat a shortage of this vital material. In that country an order has been issued which virtually gives the Government a monopoly of iron ore, by establishing a company under Government control which has the right to compel all firms concerned with iron ore mining and smelting to join the new corporation. New foundries are to be erected by the company and native ore will be exploited to the full. Last year only about 6 per cent. of the country's iron demand was met by home supply, but as new processes have been developed for smelting the native ore which is generally poor in iron content, it is considered that the new company will supply sufficient iron and steel as to be independent of "foreign dictation." It is a matter for congratulation that the shortage is to be solved in this country by private enterprise.

### The Chemist in Industry

**O**N page 104 a letter is published which re-opens the old question of the value of the chemist in industry as compared with the craftsman type of worker. A man who has been continuously employed at a works since leaving school at an early age naturally acquires a thorough working knowledge of the process on which he is engaged and to him the efforts of the young chemist when newly engaged on the process often seem entirely fruitless. Experience is at the root of the matter and it cannot be denied that when a chemist has gained works experience in addition to his chemical training he is of more value than an experienced worker without the foundation of a sound training. Adaptability is another important factor. A chemist when transferred to a new process can more readily assimilate and understand its fundamental working principles while the craftsman type of worker can only acquaint himself with the process very slowly and, further, can rarely suggest modifications and improvements in production.

## Recent Developments in Textile Processing

By

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**H**YDROGEN peroxide is an important reagent for the treatment of wool so it is useful to note that several interesting facts concerning the behaviour of this fibre towards hydrogen peroxide have recently been disclosed. Generally hydrogen peroxide is used for the bleaching of wool since the resulting white is much more permanent than that obtained in the alternative bleaching process which uses sulphur dioxide. But it now appears that this oxidant can have a somewhat subtle action on the wool fibre itself which is important from various viewpoints.

First it should be noted that hydrogen peroxide can be applied to wool for the purpose (B.P. 457798) of modifying its affinity for insoluble azoic dyes so that it is easier to produce solid shades on mixture materials containing wool, and cotton or linen. If an azoic dye is applied in the usual manner to a wool-linen mixture fabric it is found that the linen dyes to a much heavier shade than the wool and this is a definite disadvantage. But if the mixture material is first bleached overnight at 50° C. with a 1 to 2 volume solution of hydrogen peroxide, not only is the wool bleached but its dye affinity is so increased that it afterwards dyes as deeply as the linen. It seems that the action of hydrogen peroxide on the dye affinity of wool might be worth investigation in the case of other types of dyes.

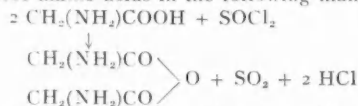
### Hydrogen Peroxide during Chlorination

The action of hydrogen peroxide on wool also comes into consideration in the unshrinkable finish for wool materials such as vests and other types of underwear. For many years such wool goods have been made unshrinkable by treating them with an acidified solution of sodium hypochlorite, followed by thorough washing and bleaching with hydrogen peroxide. Practical experience has shown that the final bleaching treatment actually improves the unshrinkability produced by the chlorination and to this extent the bleaching may be considered entirely beneficial. But recently Justin-Mueller (*Textilber.*, 1937, 18, 452) has indicated how the action of the hydrogen peroxide can reduce some of the strengthening effect of the chlorination.

Justin-Mueller suggests that during chlorination of the wool two opposing forces take part. First, a part of the sulphur content (usually about 3 per cent.) of the wool reacts to form thionyl chloride as follows:



while in the second place the wool keratin which constitutes the cortex of each fibre is decomposed with formation of free amino acids. This decomposition of the cortex is a disadvantage since it reduces the durability of the wool, but fortunately the thionyl chloride is able to cause condensation of the free amino acids in the following manner:



so that the harmful effects of decomposition are neutralised. The condensation results in the formation of *m*-keratin and if the chlorination process is correctly carried out the resulting wool fibres are actually slightly stronger than before treatment.

Unfortunately when the chlorinated wool is bleached with hydrogen peroxide the beneficial effect of the thionyl chloride is counteracted and decomposition of the wool keratin again takes place and the wool fibres are depreciated as regards both tensile strength and softness of handle. The fact that the hydrogen peroxide assists to make wool unshrinkable is most probably due to its action in removing the epithelial scales from the wool fibres, this action being made easier by the

loosening effect of the pre-chlorination. In connection with the above facts it is interesting to observe (Harris and Smith; *Amer. Dyestuff Rep.*, 1936, 25, 183) that wool treated with hydrogen peroxide does not give a brown colour with lead acetate while untreated wool gives a definite dark brown; sulphone formation being suspected.

Just as the sulphur content of wool is of great importance in determining the reactivity of this fibre, so the sulphur impurities usually present in viscose rayon can prove useful for distinguishing this type of rayon from Bemberg (cuprammonium) rayon. Both viscose and cuprammonium rayons consist of cellulose, and if it were not for the small sulphur impurity content of the former it would be difficult to distinguish between them. Herzog and Ruckert (*Textilber.*, 1937, 18, 485) give useful information on this subject, and they describe a number of distinguishing tests mainly based on being able to show the presence of sulphur in viscose rayon by means of sensitive colour reactions to which cuprammonium is practically unresponsive. In one test, 5 grams of the rayon is shaken with 15 c.c. of carbon disulphide (first freed from sulphur by shaking with mercury and re-distillation) and then 8 c.c. of the extract (this contains sulphur impurities dissolved out of the rayon) is shaken with a drop of mercury which immediately becomes brownish coloured if the rayon is of the viscose type. The mercury is then placed on a watch glass and to it is added a few drops of a solution containing 2 grams of sodium azide per 100 c.c. of N/10 iodine; numerous bubbles of nitrogen form on the mercury. Extracts of cuprammonium rayon do not behave in this manner.

### Estimating Viscose Staple Fibre

In view of the increasing use of viscose staple fibre in mixture with cotton, interest is attached to the description by Schulze and Springmann (*Textilber.*, 1937, 18, 486) of a method by which it is possible to estimate the proportions of these fibres in a mixture material. The material is first treated with a 12 per cent. solution of iodine in potassium iodide solution and then washed with water until the blue colour at first developed on both types of fibre is removed only from the cotton. The material may then be mechanically separated and the fibres weighed separately; the difference of colour greatly helps to secure an easy and accurate separation.

A new method for determining the degree to which a textile fabric is waterproof has been described by Cook and Zapanick (*Amer. Dyestuff Rep.*, 1937, 26, 323). It consists of spraying water squarely upon a weighed area of the fabric under standard conditions and then re-weighing in order to ascertain the amount of water absorbed by the fabric. The test appears to give reliable results and can be carried out within three minutes.

Glass fibres form the subject of a very interesting paper by G. Slayter (*Textile Colorist*, 1937, 59, 474) and there appears to be sufficient ground for believing that in the future it may be possible actually to use such fibres in the manufacture of clothing. Since glass fibres are already being widely used for heat insulation purposes, it seems likely that glass clothing would be satisfactorily warm.

In the production of glass fibres it is very important to recognise that their value as a textile material markedly increases as they are made finer. Not only can a very fine glass fibre be freely bent and even tied into knots without breaking, but its strength increases with its fineness. Thus the strength of glass rod may be 20,000 lb. per sq. in., while that of a very fine glass fibre will be 2,000,000 lb. per sq. in. A glass fibre has the important advantages of being fireproof and permanent; these would make it very suitable for the manufacture of curtains and tapestries. Furthermore, its high dielectric strength makes it suitable for covering wires, etc.



## Low Temperature Carbonisation Investigation

### Report of the Scottish "Oil from Coal" Committee

THE "Oil from Coal" Committee of the Scottish Development Council has now published its third report. Following the publication of its first report in March, 1935, steps were taken to carry into effect the recommendations made therein, and a Coalmasters' Sub-Committee was formed "to obtain more definite information on the demand for smokeless fuel in Scotland, by investigating the means of conducting carbonisation tests in low temperature distillation plants on several hundreds of tons of Scottish coal."

#### Demand for the Investigation

In its first report the Oil from Coal Committee clearly established that straight low temperature carbonisation is wholly insufficient to meet the country's demand for oil, and that this industry is only economic where it can realise a price for the smokeless fuel it produces substantially above the figure at which the best household coal is sold. Nevertheless it could not be denied that oil is obtained as a by-product of such processes, and every little helps especially in a time of emergency. It was, therefore, apparent that circumstances might exist under which straight low temperature carbonisation would be a commercial success, and to investigate this possibility and to meet the demand for such an investigation, the Coalmasters' Sub-Committee was entrusted with its task.

From the remarks made by consumers on the test fuels which the Coalmasters' Sub-Committee had prepared and distributed, it is clear that only the highest quality coals can be used in the manufacture of smokeless fuels for which there would be any demand at all. Data given in the present report shows that it is apparent that none of the smokeless fuels can be produced at an economic figure under present-day conditions. Indeed, only in the case of two test fuels could the smokeless briquettes or the semi-coke be produced *at a plant situated at a colliery* at a cost which is less than the price at which the merchants estimate they could pay for the smokeless fuels *delivered in their depots*. With the railway freight added, the cost of production is in every case greater than the merchants are willing to pay for the smokeless fuel, if it were delivered in large quantities.

Several thousands of tons per annum of smokeless fuel are being sold in Scotland at the present time at a price which is higher than the price of the best grade of house coal. The merchants estimate that, if they had to retail a very much larger quantity, the price that could be obtained would probably be lower, and certainly not higher, than that of a medium grade house coal. It is also stated that several thousands of tons represent the output of an economically sized plant for

only two or three weeks. However, even allowing for some unsaturation, at the present time, of the Scottish market for smokeless fuel, if something of the order of 100,000 tons per annum of such a fuel were available for sale, the fuel would have to make a market for itself by displacing household coal, and so would only fetch the price obtained for this. This was the finding of the "Oil from Coal Committee" in its first report in 1935, and it is now confirmed by the estimates put on the value of the test fuels by the merchants.

Further profits might accrue, states the present report, if it were possible to utilise a portion of the semi-coke as a fuel for the propulsion of vehicles operating on the principle adopted by Gilfords (H.S.G.), Ltd., for their high speed gas lorries. The amount of semi-coke of suitable size from the retorts which could be used directly for this purpose is, however, small. Moreover, the consumption of such material for this purpose is relatively unimportant at the present time. In a time of national emergency, however, high speed gas lorries of this type might be of considerable value as an alternative to the use of oil propelled internal combustion engines.

The production of domestic smokeless fuels by low, medium, or high temperature carbonisation at gas works is a matter which has not been considered by the Oil from Coal Committee. The remarks already given therefore apply only to the manufacture of smokeless fuel for domestic consumption at a low temperature plant specially constructed for this purpose. The Oil from Coal Committee therefore regrets very much that the results of this inquiry have not been more favourable towards the establishment of a smokeless fuel industry in Scotland.

#### Government Aid Necessary

From the whole of its review of the possibilities of the production of oil from coal, it has become apparent that for any of the processes (except, perhaps, the distillation of cannel coal at gas works) to compete with imported oil, continued and even extended Government aid is required. From the point of view of national defence, the provision of a home supply of oil is one of paramount importance, and, no doubt, this factor will influence the recommendations made to the Government by the new Oil from Coal Sub-Committee of the Committee of Imperial Defence.

Copies of the third report of the Oil from Coal Committee of the Scottish Development Council can be obtained from the offices of the Council, 75 Bothwell Street, Glasgow, C2, price 6d.

## Industrial Research in India

### Vegetable Oils for Internal Combustion Engines

THE annual report of the Industrial Research Bureau, India, for the past year shows a wide variety of work which proves valuable to Indian industries. Research has been carried out on paints, electric dry cells, and the treatment of certain vegetable oils to render them suitable for use in small internal combustion engines.

An apparatus called a "weatherometer" has been installed to enable exposure durability tests on paints to be accelerated. The suitability and behaviour as paint ingredients of many Indian raw materials are being examined. As regards the research on vegetable oils the report indicates that the staff concerned is becoming a valuable nucleus of internal combustion engine experts, capable of carrying out important investigations and of designing and developing their own engine plant and experimental accessories.

## Irish Free State Chemical Trade

### Increase in Imports January to June, 1937

IMPORTS of chemical manufactures and products into the Irish Free State during the first six months of 1937 show an increase in value over those for the corresponding period in 1936. While most of the individual imports show an increase, those of chemical food preservatives and flour improvers fell in value from £34,723 in 1936 to £5,532 in 1937. Acids were valued at £12,326 (as compared with £13,394); calcium carbide, £2,944 (£4,908); chemical food preservatives and flour improvers, £34,723 (£5,532); copper sulphate, £38,467 (£55,084); disinfectants, etc. £21,406 (£16,864); potassium compounds, £5,644 (£6,175); caustic soda, £8,054 (£6,667); other sodium compounds, £49,528 (£51,921); cream of tartar, £3,964 (£6,608); chemical manufactures and products, not enumerated separately, £82,126 (£115,728); giving a total of £259,182 (£282,881).



## Trade Matters in Parliament

### Increase of Accidents in Factories

**I**N the House of Commons on July 22 Mr. Short asked the Home Secretary whether, since the chief factory inspector's report records a large increase in accidents among adults and young persons, he can state what remedial action he proposes to take between now and July, 1938, when the new Factory Act comes into operation?

Sir S. Hoare: I much regret the increase in accidents during 1936 as compared with 1935, but, as the Chief Inspector points out in the introduction to his report, the increase in the number of accidents is partly due to increased employment, and statistics over a period of years show that the rate of accidents in proportion to the number of persons in employment is decreasing. I should like to take this further opportunity of emphasising that if any large reduction of accidents is to be obtained, it must be through the exercise of increased care by both employers and workpeople, and that this can best be secured through the development of safety organisations. As the hon. Member is aware, the Factory Department has made every effort in the past to promote such development and it will continue to do so.

Mr. Thorne: Is not the Home Secretary aware that the Chief Inspector states that thousands of these accidents are preventable; and is he not aware also that a great many of the accidents occur through machinery not being properly protected?

Sir S. Hoare: I accept it as perfectly true that a great many accidents, both in factories and on the roads, are preventable. If only employers and workpeople would pay more attention to precautions there would be many fewer accidents. So far as the Factory Department of the Home Office are concerned, we will do everything in our power to reduce the number.

Mr. Short asked the Home Secretary whether he proposes to increase the number of factory inspectors prior to the new Factory Act coming into operation; and, if so, by how many?

Sir S. Hoare: A substantial increase of the factory inspectorate will, as I have already stated, be necessary in consequence of the Factories Bill, but I am not yet in a position to say when this increase will take place.

Mr. Short asked the Parliamentary Secretary to the Board of Education whether he is aware of the increasing number of accidents to young persons employed in factories; and whether he will arrange for lectures on safety-first principles to be given to children attending schools in industrial areas?

Mr. Lindsay: I am not in possession of full information on this subject, but I will consult with my right hon. Friend the Home Secretary on the matter.

Mr. Boothby asked the President of the Board of Trade whether the government of the Union of Soviet Socialist Republics has fulfilled its obligations under the existing trade agreement; what use it is making of the £10,000,000 credit guaranteed by His Majesty's Government; and what were the main classes and value of goods purchased in this country by the Union of Soviet Socialist Republics during the most recent period for which figures are available?

Mr. R. S. Hudson: The reply to the first part of the question is in the affirmative; as regards the second part, contracts amounting to over £5½ million have been notified as having been placed under the Guarantee Agreement with United Kingdom manufacturers. Exports from the United Kingdom of the principal classes of goods registered during the six months ended June, 1937, as consigned to the Soviet Union included chemicals, drugs, dyes and colours to the value of £36,000.

Mr. S. O. Davies asked the Secretary for Mines whether he can give the prices per ton of petrol in Great Britain in the month of July, 1914 and 1918, respectively, and the present day net cost per ton of petrol produced by the hydrogenation and low-temperature carbonisation processes?

In a written reply Captain Crookshank said the declared c.i.f. values of motor spirit imported into the United Kingdom during the months of July, 1914, and July, 1918, were £9 6s. 4d. and £29 19s. 9d. per ton, respectively. He was not able to supply the information asked for in the second part of the question.

Mr. Lee asked the Chancellor of the Exchequer whether he would state the quantity of spirits used for medicinal preparations or scientific purposes in respect of which rebate was allowed under Section 4 of the Finance Act, 1918, during the year ended March 31, 1937?

In a written reply Lieut.-Colonel Colville said the quantity of spirits used for medicinal preparations or scientific purposes in respect of which rebate was allowed under Section 4 of the Finance Act, 1918, as amended, during the year ended March 31, 1937, was 534,000 proof gallons.

## Safeguarding of Key Industries

### Addition to the List of Organic and Fine Chemicals

AN additional list of articles chargeable with duty under Part I of the Safeguarding of Industries Act, 1921, has been issued by the Board of Trade and will take effect as from August 19, 1937. This list refers to articles under the heading of synthetic organic and other fine chemicals. Certain amendments to List H issued in 1921 and List H(ii) issued in 1926, which will take effect on the same date, have also been made under section 5 (3) of the Finance Act, 1936. These amendments consist mainly in the deletion of trade names and the insertion of chemical names to replace them where an equivalent did not already exist in the lists.

Synthetic organic dyestuffs, colours and colouring matters imported for use as such and organic intermediate products imported for their manufacture are not liable to duty under Part I of the Safeguarding of Industries Act, 1921. Synthetic organic dyestuffs, colours and colouring matters and organic intermediate products used in the manufacture thereof are, however, liable to duty.

The additional list of articles chargeable with duty include:

Acids, their salts and esters (iodobenzoic, iodosobenzoic, iodoxy benzoic, mandelic, phenylcinchoninic, and toluyl benzoic), aminobenzene sulphonamide and other aryl sulphonamides (substituted or not), amyl cresyl oxide, benzene sulphonanilide and other aryl sulphonarylamides (substituted or not), benzyl butyl ether, benzyl cresyl oxide, butylene glycol and its esters, calcium laevulinate, cedrol, cetyl phthalate, cyclopropane, decyl esters, diphenyl benzidine, ergometrine, ergotinine, heptyl esters, histidine, hydroxycitronellal acetals, lauryl phthalate, magnesium stearate, naphthyl butyl ether, octyl bromide, phenylhydrazine zinc chloride, santalyl esters, trichlormethyl benzyl carbinol, undecalactone, vetiverol and its esters, and zinc laurate.

When any organic chemical in this list includes a simple or compound radical which is not qualified by ortho, meta, para, alpha, beta, iso, etc., the list is to be read as including all forms of the chemical covered by the introduction of such qualifications of that radical. This list includes the salts of any amino and other basic organic compounds named there.

## The Chemical and Allied Imports of Malaya

### Increased Trade with the United Kingdom

A REPORT on economic and commercial conditions in Malaya recently published for the Department of Overseas Trade (H.M. Stationery Office, price 1s.) shows that the substantial rise in world prices of tin, rubber, copra, and palm oil are factors which have contributed to an increased total trade in Malaya in recent years. The value of imports from the United Kingdom showed an appreciable advance in 1935 over 1934 and in 1936 the value was slightly in excess of 1935. Japanese competition still persists and standards of value are now based on the cheap rather than the moderately-priced article. This legacy of the days of depression results in acute competition in most classes of imported goods.

#### Natural Resources

If Malayan economy be viewed as a whole the country is seen as one liberally endowed with natural resources; as being sound financially; and as supporting an indigenous population, easy-going and contented by nature, whose livelihood is won from the soil and the sea. As to the future, the policy of moderation of the safeguarding of finances is not likely to be departed from whilst conditions remain variable in the world at large. Of tin and rubber, the twin tributaries which regulate the main flow of Malayan trade, confidence in the continued prosperity of the metal and the plantation product should not be misplaced, having regard to the sustained world demand for motor vehicles, increasing activity in the tinplate industry, re-armament schemes and more tangible efforts which are being made to further recovery in international trade by way of currency stability and tariff concessions.

The report has chapters on the export and import trade of Malaya with a detailed analysis of the principal classes of imports of interest to United Kingdom traders, from which the following statistics of chemical interest are taken:—

IMPORTS OF CHEMICALS, DRUGS, DYES AND COLOURS.			
	1934.	1935.	1936.
Total Imports .. .. .	11,245	10,352	8,677
Imports from United Kingdom ..	2,885	3,144	3,075
Imports from other British Territory	3,446	1,311	5

OILS, FATS AND RESINS (Manufactured).			
	1934.	1935.	1936.
Total Imports .. .. .	73,072	76,355	73,225
Imports from United Kingdom ..	1,151	1,054	1,078
Imports from other British Territory	4,271	8,005	8,289

Formic Acid.					
	1934.	1935.	1936.		
	Tons.	Tons.	Tons.	(ooo).	(ooo).
Total Imports ..	2,415	1,955	701	1,574	659
United Kingdom ..	677	290	634	254	435
Continent of Europe	1,643	725	1,252	485	1,053
Japan .. .. .	96	32	68	22	85

Germany and the Netherlands compete strongly for the market for formic acid which is used extensively in the rubber industry.

#### Disinfectants, weed-killers and other Insecticides (Imported in liquid form).

	1934.	1935.	1936.
	Gall.	Gall.	Gall.
	(ooo).	(ooo).	(ooo).
Total Imports ..	103,090	140,946	161,105
United Kingdom ..	92,316	109,809	124,908
United States ..	6,613	24,787	31,816

Competition from the United States is largely confined to household insecticides and exterminators.

#### Soda and Sodium Compounds.

	1934.	1935.	1936.
	Cwt.	Cwt.	Cwt.
	(ooo).	(ooo).	(ooo).
Total Imports ..	68,690	72,887	303,520
United Kingdom ..	44,106	225,493	218,407
Continent of Europe	7,713	45,169	13,205
Japan .. .. .	4,599	15,157	53,843

The reduction in this trade has been greater in value than in volume. Germany and Belgium are the competing European countries.

#### Paints and Colours.

	1934.	1935.	1936.
	\$(ooo).	\$(ooo).	\$(ooo).
Total Imports .. .. .	1,084	1,380	1,366
United Kingdom .. .. .	801	1,023	1,027
United States .. .. .	89	102	75
Japan .. .. .	45	88	102

The demand for paints and colours has been well maintained as the result of activity in the building trade. Imports from Japan continue to advance steadily.

#### Imports of Soap

##### Soap (Household and Washing).

	1934.	1935.	1936.
	Cwt.	Cwt.	Cwt.
	(ooo).	(ooo).	(ooo).
Total Imports ..	74,390	59,727	69,604
United Kingdom ..	52,889	40,206	47,001
Other British Empire ..	12,290	8,658	10,838
Japan .. .. .	9,082	10,785	11,580

Imports from the United Kingdom in relation to those from other sources of supply continue to be satisfactory. Australia is the source of origin under the heading "Other British Empire." Both household and washing soaps are also manufactured locally. Exports in 1936 totalled 14,161 cwt. valued at \$92,000.

##### Toilet Soap.

	1934.	1935.	1936.
	lb.	lb.	lb.
	(ooo).	(ooo).	(ooo).
Total Imports ..	1,016	1,013	1,144
United Kingdom ..	360	353	498
United States ..	65	92	95
Japan .. .. .	380	81	313
Netherlands East Indies ..	131	58	168

The United Kingdom experiences more competition in this trade, into which local production also enters, than in household and washing soap. The cheapness of the Japanese product should not pass unnoticed. Exports have declined during each of the past three years.

#### Fertilisers

##### Chemical Fertilisers containing Nitrogen.

	1934.	1935.	1936.
	\$(ooo).	\$(ooo).	\$(ooo).
Total Imports ..	3,102	2,279	11,892
United Kingdom ..	2,742	182	9,228
British India and Canada ..	115	12	563

The increasing demand for this product reflects the more satisfactory condition of agriculture generally.

##### Chemical Fertilisers containing Potassium and Phosphorus.

	1934.	1935.	1936.
	Tons.	Tons.	Tons.
	(ooo).	(ooo).	(ooo).
Total Imports ..	1,868	3,108	1,740
United Kingdom ..	1,331	3,108	1,740
Other British Empire	115	9	326
Continent of Europe	885	31	2,226
Netherlands Indies	142	6	191

The Netherlands and Belgium are leading sources of supply. British India and Palestine each have a share in the trade. Imports from the United Kingdom substantially increased in 1936.

## Lac Research in India

### New Uses for Shellac

THE Indian Lac Research Institute has done a large amount of important research during the past year. Although the primary object of the Institute was to devise improved methods of cultivation and to improve the quality of lac produced by growing healthy strains, the field of research was later widened to include projects to counteract the inroads of synthetic substitutes, and to find new uses for shellac in industries which were being rapidly developed by the synthetic resin trade. Fundamental research work has been undertaken to solve the mystery of the shellac resin complex, with a view to ensuring the future development of new uses of shellac. The isolation of pure resin in shellac by a new method, and shellac modified by organic acids, have also initiated new lines of work from which important technical applications are expected. The most important constituent of shellac, aleuritic acid, has now been technically separated by a new method, and therefore becomes available for chemical and technical transformations.

Definite progress has also been made on the manufacture of shellac-moulded articles, especially the quick production of smaller articles of everyday use. A German firm tested the suitability of the shellac moulding powders sent from the Institute and found them satisfactory for injection moulding, as a result of which the establishment of an injection moulding industry, whether in India or outside, with shellac as raw material, is envisaged in the near future. The use of shellac in minor industries, and also possible new uses in India, are under investigation.

Two analytical methods for detecting adulteration in shellac have been improved upon. Work is also being undertaken on the problem of standardising shellac products. There are a large number of different grades, marks and types of shellac, button lac and seed lac on the market. The possibility of establishing a series of standard grades, into which each existing grade could be fitted is being examined.

Among the investigations in hand, one of the most important is the study of the chemistry and constitution of shellac and the possibility of modifying or removing the reactive groups by the action of certain chemicals. It is hoped in this way to produce considerable changes in the properties of shellac and thus extend the possibilities of industrial application. In particular it has been demonstrated that considerable improvement in water resistance can be produced by mild



[By courtesy of the London Shellac Research Bureau.]

The Indian Lac Research Institute at Ranchi.

and controlled oxidation. The by-products of shellac manufacture, which are sold at one-quarter of the price of shellac although they contain 50 to 60 per cent. of shellac, are being investigated for the recovery of all the shellac in them in a pure form. A successful completion of this process will prove of immense benefit to all shellac manufacturers. Alternatively the use of such refuse lac for moulding, or isolation of useful distillates for the manufacture of lubricants and greases, has been proved.

The problems of shellac manufacture have been examined and information on new mechanical means of purification has been collected. It is considered at present advisable to continue the traditional process of purification since the consumer has learnt to judge and appreciate the quality of hand-made shellac. The possibility of improving the uses of by-products, the large percentage of which is the chief disadvantage of the old process, is being studied. Factors involved in the successful bleaching of lac have been studied.

The annual production of lac in India varies between 800,000 and 1,000,000 maunds, and the exports of shellac of all kinds vary from 400,000 to 600,000 cwts. valued at approximately between Rs. 2 and Rs. 2½ crores (£2,000,000). Exports of lac products in 1936-37 amounted to 836,000 cwts. and were the highest in the history of the shellac industry. The largest purchaser of Indian lac is the United States, which increased the demand to 365,000 cwt. as against 170,000 cwt. in the previous year. The next important purchaser is the United Kingdom with a demand for 182,000 cwt. as against 77,000 cwt. in the previous year.

## American Chemical Engineering

### Forthcoming Annual Exposition in New York

THE 16th Exposition of Chemical Industries will be held at Grand Central Palace, New York, December 6-11, 1937. In addition to exhibitors from the American chemical industry there will also be a large number of nationally-known concerns which have indirect connection with chemical manufacture.

A feature of this year's exhibition will be the award of a prize of \$250 in cash to the person submitting the "best descriptive expression encompassing the purposes and the benefits redounding to the common good from the activities of the chemical industries." It is felt that the chemical industries contribute more than anything else to the progress and happiness of mankind and to summarise the broad aspects of this conclusion a condensed expression or slogan is desired.

Raw materials, finished products, plant equipment, machinery and apparatus will constitute major sections of the exhibition. Metals and alloys will be featured, likewise the newer synthetic plastics and moulded products. The standard

applications of glass as an industrial commodity will be augmented by forms, such as the fibrous glass which is used for filtering air and liquids. Exhibits devoted to unit processes will include the handling of fuels and the production of power. Crushing, grinding, and mechanical separation will be represented by sifters, agitators, classifiers, and ball mills. Classification based on magnetic properties of the materials handled; filtration, evaporation, and drying; and the co-ordination of brewing and distilling with the latest advances in the field of chemical engineering will be featured.

The student course in chemical engineering which has become an established feature of the Exposition of Chemical Industries will again be presented; Professor W. T. Read, of Rutgers University, will again be in charge. The educational committee, under whose auspices the student course in chemical engineering is held, is headed by Professor Harry J. Masson, director of the department of chemical engineering, New York University.



## Lubrication and Lubricants

### Discussion at Institution of Mechanical Engineers

THE Council of the Institution of Mechanical Engineers, with the co-operation of other societies and institutions, have decided to hold a general discussion on "Lubrication and Lubricants," October 13-15, 1937, when a series of some 140 papers from leading authorities throughout the world will be presented. An endeavour will be made to establish a correlation between theory and practice and show how bearing design can be applied, to relate academic research with trade practice, to obtain current views upon bearing metals, and to review the significance of laboratory tests, including wear and friction tests.

An exhibition will be held at the Science Museum, South Kensington, to illustrate the subjects under discussion, and will be devoted to lubricants, bearings and bearing materials, as well as to testing and other apparatus. The exhibition will be open for a fortnight from October 13. Support for the discussion has been given by 29 British societies and technical institutions and by 19 overseas societies and technical bodies.

Among the papers which have been promised are "Structure, Properties, and Performance of Synthetic Resin Bonded Bearing Materials" (G. R. Eyssen), "Heavy Duty Bearings of Phenolic Plastics" (H. M. Richardson, General Electric Co., U.S.A.), "Bakelised Bearings" (H. Rochester, Metropolitan-Vickers Electrical Co.), "Lubrication of Laminated Synthetic Resinoid Bearing Materials" (H. W. Rowell, Ellison Insulations), "Influence of Catalysts on the Oxidation of Oils" (T. K. Hanson and Professor A. C. G. Egerton, Imperial College of Science and Technology), "The Effect of Rate of Shear upon Effective Lubricant Viscosity" (D. P. Barnard, The Standard Oil Co. of Indiana), "Some Observations on the Effect of a Number of Added Substances on the Lubricating Properties of Oils" (H. W. Brownson, I.C.I. Metals), "Metal Soaps in Lubricants" (E. A. Evans, C. C. Wakefield and Co.), "The Adsorption of Oils in relation to Lubrication" (Professor J. J. Trillat, Besancon University), "Thermal Effects on Oiliness in Lubricants" (G. Vogelpohl, Charlottenburg Technical High School), "Oiliness and Molecular Influences in Lubrication" (Paul Woog, Cie. Francaise de Raffinage), "The Relation between Chemical Constitution and Properties in Lubricating Oils" (Zorn, I.G. Farbenindustrie).

To render practicable the adequate discussion of the papers within the limited time available, short summaries of the papers will be prepared. The complete proceedings will be issued as a bound volume. Complete sets of advance copies and bound volume of Proceedings will be available at the special reduced rate of £1, if ordered before September 28, 1937. Bound volume of proceedings, if not ordered before September 28, 1937, will cost £1 5s.; complete set of advance copies, 8s.; advance copies of the papers in four groups, 2s. 6d. per group. Those who desire to attend the discussion and wish to obtain advance copies of the papers and subscribe for the volume of proceedings should apply early.

Application forms for tickets of admission to the discussion and for copies of papers, and further information about the discussion may be obtained from the Secretary, Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1.

THE Institution of Chemical Engineers announces that the following candidates were successful in the Associate-Membership Examination for 1937:—Bernard Boaler, Francis Alan Butt, Ian Gordon Cumming Dryden, Abraham Woolf Greenstein, Stanley Alfred Horace Hunn, George Cyril Marshall, John Nixon, Frederick George Seymour, Alan Taffel, Martinus Johannes van de Zijden, and Harold George Woolman.

On the result of the examination, the William Macnab Medal for 1937 has been awarded to Mr. Martinus Johannes van der Zijden.

## Colour Worker's Dermatitis

### Action by Employer Fails

THE action under the Workmen's Compensation Act, to which reference was made in THE CHEMICAL AGE last week (page 87), was decided in Bow County Court, by Judge Forbes, on July 23, when he delivered a considered judgment. The applicants were J. W. and T. A. Smith, Ltd., colour merchants, of 249 Old Ford Road, E., and they were asking for a review of the compensation being paid to John Hugh McCarthy, of 7 Devonshire Road, Stratford, E., a fitter's mate.

At the hearing of the case it was stated that the respondent contracted dermatitis when employed as a stoker by the applicants on June 19, 1936, when he was earning £3 10s. a week. There seemed no disagreement amongst the doctors as to his ability to work now if he could find a job which did not bring him in contact with dust or liquids, which would start up the dermatitis again, from which he was all but free. It was also mentioned that he had previously been employed by Linfoot and Cooper, Ltd., colour manufacturers, of Maryland Road, E., when he was earning £5 5s. a week. There he contracted dermatitis when working in the colour shop, and he was shifted to other work.

Mr. Pugh, who appeared as counsel for the applicants, said if that were the case it seemed that they were not really liable in the first place, and the proper people to sue would have been Linfoot and Cooper, where the complaint originated. As they had admitted their liability in the present case, he admitted it complicated the matter.

In giving judgment, Judge Forbes said there was no doubt the applicant had had dermatitis when working for Linfoot and Cooper in their colour shop, years ago, and under certain circumstances they might have been the parties who ought to have been sued. But in the case before him it was clear the applicants were liable as they had accepted liability. The man was being paid 30s. a week compensation, and the applicants wanted that reduced as they said the respondent was capable of doing some light work. From the evidence before him, however, he was convinced that the dermatitis was still about the man, and was active, so that he could not say he was able to do anything in the way of light work even. Under the circumstances the applicants failed, and the award would be in favour of the respondent and his compensation would continue.

Judgment was entered accordingly with costs.

## Society of Glass Technology

### Visit to Denmark

IN extension of its endeavours to foster friendly international relationships between persons and countries in which the study of glass is of importance, the Society of Glass Technology organised a trip to Denmark early this month. The invitation came through Professor A. H. M. Andreassen, of the Department of Cement, Ceramics and Glass, at the new Technical University of Copenhagen. The party of between 40 and 50 members of the society was headed by Professor W. E. S. Turner, of the Department of Glass Technology, Sheffield University.

It was seen that the glass industry in Denmark is a small but vigorous one, working energetically to make itself sufficient for the needs of the country. The visitors were particularly struck by the variety of ware being made at one and the same time in some factories. Another notable feature was the absence of night work in all non-continuous processes. By melting through the night and working out during the day a high rate of production was reached. A new plant has recently been started up for the production of sheet glass by the Fourcalt process and is just getting into its stride. Automatic container forming machinery was seen both at Hellerup and Holmegaards. Severe competition, particularly from Czechoslovakia has led recently to increase in import duties to safeguard the Danish industry.

## Catalytic Oxidation of Hydrogen Sulphide

### A Use for Activated Carbon

A COMPREHENSIVE review of the patent situation in respect of the oxidation of hydrogen sulphide in coal gas to elementary sulphur is given in a recent issue of *Chemiker Zeitung*, 1937, 247, 267. In these gases the quantity of hydrogen sulphide present ranges from about 7 to 15 grams per cubic metre, according to the origin of the coal retorted. In some cases, and especially when the gases are used for catalytic syntheses, the complete removal of hydrogen sulphide is essential.

By some processes of sulphur removal from gases, use is made of the property of active carbon to accelerate the oxidation of hydrogen sulphide by air or sulphur dioxide to elementary sulphur catalytically. In these methods the sulphur collects on the surface of the active carbon from which it is extracted by solvents or by other treatment. The oxidation of the hydrogen sulphide is favoured by the presence of basic materials such as amines and ammonia (about 0.3 grams per cubic metre), and also by loading the gas with steam. If, for example, coal gas containing 10 grams of hydrogen sulphide per cubic metre is saturated with steam at 100° C. before it enters the carbon contact, the carbon becomes loaded with sulphur up to 70 per cent. of its weight against about 5 per cent. with dry gas. It is very important to select a suitable catalyst; at first wood or animal charcoal was employed, but later it was found that an artificially activated carbon, and especially a carbon treated with zinc chloride, was a much superior material.

Carbon-containing substances have also been found suitable as catalysts; active carbon to which iron or manganese oxides have been added, has proved very satisfactory, and the addition of ammonia has also been found to increase the adsorbent activity of the active carbon.

The obtaining of elementary sulphur from hydrogen sul-

phide is very simple; the coal gas containing the hydrogen sulphide is previously freed from tar constituents, and with ammonia or steam and a sufficiency of air for the theoretical oxidation of the hydrogen sulphide, is passed through an absorber charged with about 2 cubic metres of the active carbon. After about 40,000-50,000 cubic metres of gas have passed through the active carbon the latter becomes more or less saturated with sulphur. Generally, several adsorbers are employed and arranged side by side, or otherwise the hydrogen sulphide is oxidised by stages through passing through several adsorbers one after the other.

The catalytic oxidation of hydrogen sulphide in active carbon contacts can be carried out either at ordinary or higher temperatures, but the temperature determines the physical character of the sulphur product. If a temperature below the melting point of sulphur is employed, the sulphur deposits on the carbon surface and is extracted by solvents, such as carbon bisulphide and mono and di-chlor benzol but usually a solution in water of ammonium sulphide in a reducing or inert atmosphere is employed as solvent, or the sulphur is evaporated by heat and condensed. According to the method of operating, the elementary sulphur is obtained as a fine powder, in granular form, or in the molten condition. The sulphur can also be driven out of the active carbon by superheated steam. Finally, it is possible also to drive out the elementary sulphur, as it forms by the oxidation of hydrogen sulphide, by maintaining a temperature in the adsorber of 120-170° C. when the sulphur is obtained in liquid form.

In a very similar manner the recovery of elementary sulphur from hydrogen sulphide in coal gas is effected by using sulphur dioxide as the oxidising medium; the mixed gases are passed through the active carbon adsorbers, and the recovery of the sulphur from both gases is practically quantitative.

## Schoolgirl's Laboratory Accident

Judgment for Frederick Allen and Sons  
(Poplar) Limited

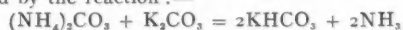
ON June 16 damages amounting to £3,119 were awarded to Marjorie Juliette Kubach, a schoolgirl, who lost an eye in an explosion in a laboratory at Park School, Lancaster Road, South Norwood. The original claim was against the headmistress of the school, and Townson and Mercer, Ltd., who supplied the chemicals employed in the laboratory. The second defendants brought in Frederick Allen and Sons (Poplar), Ltd., manufacturing chemists, of Upper North Street, E., as third party. The jury found that there was no negligence or breach of contract on the part of the headmistress, and judgment was given against Townson and Mercer, Ltd. The claim by Townson and Mercer, Ltd., for an indemnity from Frederick Allen and Sons (Poplar), Ltd., who, they asserted, had sold them as manganese dioxide a chemical containing antimony sulphide which, with another chemical, caused the explosion, was heard on June 17. At the conclusion of the argument, the Lord Chief Justice said he would consider his judgment and deliver it later.

On Thursday, Lord Hewart, the Lord Chief Justice, gave his reserved judgment in the King's Bench Division. Judgment was given for Frederick Allen and Sons (Poplar), Ltd., without costs. His Lordship pointed out that the third parties supplied the chemicals to Townson and Mercer, Ltd., together with an invoice which intimated that the goods should be examined and tested before use. Townson and Mercer, Ltd. neither did that nor did they pass the warning on to their customers.

## CO<sub>2</sub> from Waste Gases

The Macmar Process of Recovery

THE principles, and the results of a pilot plant test, of the "Macmar" process for the recovery of carbon dioxide from waste gases, whereby very pure CO<sub>2</sub> can be obtained with high efficiency from gases poor in it, are described by Martin and Killeffer (*Ind. Eng. Chem.*, 1937, 29, 632-636). In place of the direct absorption in K<sub>2</sub>CO<sub>3</sub> solution, as normally practised, the CO<sub>2</sub> in the waste gases is caused to react with gaseous NH<sub>3</sub>, forming ammonium carbonate, which is absorbed in K<sub>2</sub>CO<sub>3</sub>-KHCO<sub>3</sub> solution, from which the ammonia is re-evolved by the reaction:—



so that a continuous circulation of ammonia is kept up in the absorption tower. CO<sub>2</sub> is boiled off from the lye in the usual manner, and washed free of NH<sub>3</sub>.

In a pilot plant test (capacity ½-ton of CO<sub>2</sub> per day) the efficiency of absorption decreased from about 80 per cent. for gases containing less than 7 per cent. CO<sub>2</sub> to 42 per cent. for a 16.2 per cent. content, whilst in the ordinary alkali process, the efficiency increases from below 10 per cent. to 30 per cent. in this range. The loss of ammonia was about 0.1 per cent. An increase of capacity was obtained by packing the absorption tower with steel shavings instead of coke. The increased efficiency is said to be due to the very rapid reaction of the ammonia and carbon dioxide, and the much greater solubility in carbonate lye of the ammonium carbonate thus formed than of CO<sub>2</sub> itself. The NH<sub>3</sub> functions as a catalyst in dissolving the CO<sub>2</sub>. The process should prove very valuable in dealing with the waste flue gases of power plants, whose CO<sub>2</sub> content falls within the region where high efficiency is obtained with the new process.

## Letters to the Editor

### Low Temperature Carbonisation and Coal Mining

SIR,—I am somewhat surprised to note that Mr. Robert H. Morgan, writing from the House of Commons, is questioning the value to the coal-mining industry of the process of low temperature carbonisation. Even more remarkable is his attempt to disparage an enterprise which will be of great help to the Special Areas.

In the first place, Mr. Morgan gives cold approval to the words of the report of the Royal Commission on Mines, apparently in the belief that in doing so he is commenting on the opinions of Colonel W. A. Bristow. Actually his criticisms are directed against certain passages of the report quoted verbatim by Colonel Bristow at the annual general meeting of Low Temperature Carbonisation, Ltd.

And what did this report say, after hearing the evidence of all the leaders of the colliery owners and mine workers? It urged the necessity for seeking new methods of utilising coal, and stressed the great national advantages which would ensue from a perfected low temperature carbonisation process.

I cannot believe that Mr. Morgan is really trying to condemn enterprise and industrial advance, which are imperative if we are to restore economic health and end the human suffering of the Special Areas. His doubts as to whether the low temperature carbonisation of coal will help the coal mining industry can best be overcome by a simple statement based on facts. The statement is that a particular process transmutes a ton of small coal costing, let us say, thirteen shillings, into a ton of other products, all useful, which can be sold on the market for 35s. or more—an increase in value which must eventually be of enormous importance to owners and men alike.

Obviously, the continued burning of raw coal, itself a rich deposit of valuable oils, in other than efficiently designed boiler plants, is a deplorable waste—in fact, a senseless extravagance which does nobody any good, and seriously reduces the potential wealth of the nation, apart from the further disadvantage that it fills our towns with smoke.

Lord Portal, whose report on South Wales was presented to the Government in 1934, and whom Mr. Morgan tries to secure to support his doubts, is the chairman of the Nuffield Trustees, who have just voted a large sum for starting a process in Wales—certainly not without enquiry. Without doubt, we ought to encourage all efforts to improve the financial worth of British coal resources by producing fuels and by-products, all of which can be used efficiently in ordinary service.—Yours faithfully,

E. F. SPANNER.

9 Billiter Square, E.C.3.

### The Chemist in Industry

SIR,—I agree with every word which "External Graduate" writes in THE CHEMICAL AGE of May 29, page 483. If knowledge is to be of value it must be acquired in the industry to which it is to be applied. Success in the chemical industry depends upon a sound elementary chemical knowledge, together with experience and practice. However, there are chemists, with degrees, whose chemistry is very poor.

For example, at the works where I was employed a trouble cropped up in the production of some goods dyed with manganese bronze dyes, which developed discoloured spots, and one day 8,000 yards of cotton cloth were completely ruined. In the meantime several attempts had been made by a chemist (M.Sc.) to find the cause of the trouble, without result. Finally the question had to be submitted to a foreman who found that some rusty water was being splashed on to the goods during one of the operations. It took him less time than it takes me to write this to discover that the spots were a compound of iron and manganese oxides; also to find out where the damage was done and how to prevent it. This foreman had been in the industry since the age of eight—going half-time to school, and in later years attending some local chemistry classes, never having seen inside a university or high school.

## The Distillers Co., Ltd.

### Trade in Industrial Alcohol and Chemicals

THE 60th annual general meeting of the Distillers Co., Ltd., was held in the North British Station Hotel, Edinburgh, recently, when Sir Alexander Walker presided in the unavoidable absence of Mr. Thomas Herd, the chairman of the company.

In dealing with the various activities of the company Sir Alexander said that the industrial alcohol trade has shown an increase during the year, and, although prices leave comparatively small margins, the increase in sales and the economic efficiency of the company's distilleries are factors in keeping down the costs of manufacture. A supply of this spirit at these low prices has enabled many new manufactures to be started in this country, and the high standard of the company's spirit, both methylated and unmethylated, is appreciated by these trades.

There has also been progressive development in the chemical section of the company, and there may emerge during the current year the manufacture of new products, and this may necessitate considerable outlay on buildings and plant. As indicated at the last annual meeting of the company, new discoveries and synthesis, based on alcohol or alternative raw materials, are continually being brought to the company's notice, whether from their own research laboratories or from abroad. "It is often disconcerting," said Sir Alexander, "to forecast which of several new processes may prove to be the most economic, having regard to the changes taking place in the raw material market, and we may be compelled, to use the language of our sporting directors, 'to back two or three for a place.' This has been the practice of some of the largest chemical companies on the Continent and in the United States, and there is no alternative if we are to hold our place in the industry."

The market for carbonic acid gas shows steady development, more particularly in respect of its solid form known as dry ice, under the company's brand name of "Cardice." Plants at Dagenham and Hull have been fully occupied, and new units have been installed at Bankhall and Hammersmith to meet any additional requirements of the trade.

### Results for the Year

Turning to the profit and loss account, Sir Alexander said that the net profit for the year available for appropriation to reserves and for dividends amounted to £2,458,416, an increase on last year's figure of £136,839. This profit constitutes a record in the history of the company, and it was proposed that it should be partly applied towards making an increased distribution on the ordinary stock. After giving effect to the appropriations detailed in the report, the balance carried forward at the credit of profit and loss account amounted to a final dividend on the preference stock of 3 per cent. less tax, making, with the interim dividend of 3 per cent. already paid, a dividend of 6 per cent. less tax for the year, and also a final dividend on the ordinary stock of 12½ per cent. less tax, making, with the interim dividend of 7½ per cent. already paid, a dividend for the year of 20 per cent., less tax, also the payment of a bonus of 2½ per cent. less tax on the ordinary stock was declared, carrying forward to next year a sum of £343,249 1s. 5d.

Mr. J. M. Connell, Mr. C. G. Hayman and Mr. R. H. Stein were elected directors of the company; Capt. R. Macdonald-Buchanan, Mr. H. J. Ross, Sir Alexander Walker, Mr. P. M. Dewar and Mr. Thomas Herd were re-elected.

The re-election of Moores, Carson and Watson, C.A., as auditors for another year was duly approved.

It is instances such as this that often make chemists look ridiculous in the eyes of the workmen. The age of 20 is too old to begin at a works, and B.Sc. (book scholars) may be all right for research if they are well trained in the elements of chemistry. But it must be left to the scientific practitioner to make use of their work.—Yours faithfully,

ANOTHER EXTERNAL GRADUATE.



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OILS.—Characteristics of and tests for lubricating oils. P. Kovache, *Arts et Métiers*, 91, 121-126.

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## Chemical Notes from Foreign Sources

### Finland

EXTENSIVE NICKEL DEPOSITS are reported to have been located near Nivala in Central Finland.

### Belgium

A FUSION IS ANNOUNCED between two nitrogen companies, the Société Belge de l'Azote and the Société des Produits Chimiques de Marly. The combined output capacities will be in the vicinity of 62,000 tons nitrogen per annum.

### France

COLLOIDAL SULPHUR IN THE DRY STATE or in concentrated suspension is obtainable by atomising the initially formed suspension in a current of air or inert gas maintained at a temperature of 80 to 150° C. (French Pat. 807,860).

THE FORMATION IS ANNOUNCED of the "Lanital Français" which will engage in the production of casein artificial wool. The initial share capital of 12 million francs has been taken up to a substantial extent by the Snia Viscosa and the Ferretti Company.

A NEW PROCESS FOR SYNTHESISING CHLORINATED NAPHTHOLS commences from a chlorinated naphthalene which is reacted with a caustic alkali. To obtain 4-chloro-1-naphthol, the starting material is 1,4-dichloro-naphthalene, pressure reaction of which with potassium hydroxide leads to substitution of one atom of chlorine by a hydroxyl group. Details of this method (French Pat. 807,536) are as follows: 150 grams 1,4-dichloro-naphthalene, 200 grams potassium hydroxide and 500 c.c. methyl alcohol are heated in an autoclave for 20 hours at 190° to 210° C. with a copper coil as catalyst. After termination of the reaction, the mixture is cooled, the alcohol distilled off, and the residue filtered and acidified with dilute sulphuric acid when 4-chloro-1-naphthol separates as a brown oil which is purified by fractional distillation in vacuo.

### Denmark

EXPANSION IN CASEIN PRODUCTION is planned by the Dedanske Mælkekondenseringsfabriker, as there are prospects of developing an increased export trade to Italy.

### China

THE PRODUCTION OF TRANSPARENT PAPER is to be carried on at a new factory constructed by the Dainippon Celluloid K.K., at Tientsin, utilising North Chinese cotton as raw material.

### Holland

WITH A VIEW TO EXPLOITING PATENT RIGHTS for the production of textile casein and casein artificial wool, a company has been formed under the name of Hollandische Industriële Maatschappij voor Caseinbereiding.

### Switzerland

HOFFMANN LA ROCHE OF BASLE closed the last trading year with a net profit of 2½ million Swiss francs as compared with 2.2 million francs in the previous year. The dividend is raised to 35 francs (from 28) per share.

### Roumania

THE BAT'A CONCERN OF CZECHOSLOVAKIA has secured permission for erection of a carbon black factory with a daily capacity of 2 tons, which is exclusively intended for export.

DEVELOPMENT OF AN EXPORT TRADE IN NATURAL GAS is under consideration by the Ministry of Commerce, which has appointed a commission to examine the possibilities.

AN INCREASE OF SOYA BEAN CULTIVATION AREA is reported by a leading planting concern, the 1936 area of 58,000 hectares comparing with 110,000 hectares in the first half of 1937. During 1936, 30,000 tons of beans were harvested, of which 24,000 tons were exported, 1,500 tons were delivered to the oil factories and 4,500 tons were reserved for sowing.

## Cellulose Benzoylation

### The Mechanism Investigated

LORAND and Georgi (*J. Am. C.S.* 1937, 59, 1,160-70) have carried out an investigation of the mechanism of cellulose benzoylation, in which alkali cellulose prepared from cotton linters was benzoylated under conditions favourable to the preservation of the fibre structure.

A microscopic study of the changes within the fibres in the course of benzoylation showed that the reaction is greatly influenced by the presence of two immiscible liquid phases (water and benzyl chloride), which causes diffusion difficulties. As alkali cellulose reacts with benzyl chloride, the originally hydrophilic system becomes hydrophobic, whereby aqueous lye is expelled and a dispersion is formed. This and the swelling of the increasingly organophilic system in benzyl chloride facilitate microscopic observation of the reaction.

The progress of the chemical conversion depends on the ratio between the reaction velocity and the speed of diffusion. At about 60°, the two are of the same magnitude; as a result, the reaction zone progresses continuously toward the centre of the fibre. Even under these favourable conditions, the reaction is of the topochemical macroheterogeneous type, *i.e.*, starting at the surface of the fibre, it is propagated from layer to layer. With rising temperature, the reaction velocity increases more rapidly than the rate of diffusion. In this way, difference in the degree of benzoylation of the fibre layers arise. The highly substituted outer layers form an insulating jelly shell around the unreacted region, thus preventing diffusion, and the reaction comes to a stop unless the shell is mechanically broken.

## Chemists at Portsmouth

### A Flourishing New Local Society

THE City of Portsmouth and District Chemical Society, which was recently formed, has now attained a membership of 56. The society was inaugurated mainly by the activities of Mr. F. G. Edmed, B.Sc., F.I.C., a past vice-president of the Institute of Chemistry, and Dr. A. M. Ward, D.Sc., F.I.C., the recently appointed vice-principal and head of the department of chemistry at Portsmouth Technical College.

Designed to offer facilities for wide constructive contacts in industrial and applied chemistry, the society's programme has already included organised visits to the Agwi Oil Corporation Refinery at Fawley and to a well-known brewery. Lectures have been given by Dr. Ward on "Experiments with Some Indicators," and by Dr. A. D. Mitchell on "Some Idle Thoughts of An Idle Analyst."

A particularly useful programme has been arranged for the approaching session and meetings will be held at the Portsmouth Technical College. Speakers will include Dr. Mapson, Portsmouth, who will discuss a biochemical topic; and Dr. E. A. Rudge, F.I.C., A.M.I.Chem.E., of West Ham Technical College, on "Timber in Industry." The chairman of the society is Mr. F. G. Edmed, Admiralty Chemist.

The society's hon. secretary and treasurer is Dr. F. R. Williams, B.Sc., A.I.C., assistant analyst to the Admiralty Chemist, who will be glad to receive applications for membership from any chemists living within reach of Portsmouth. Communications should be addressed to Dr. F. R. Williams, Department of the Admiralty Chemist, H.M. Dockyard, Portsmouth.

## Personal Notes

MR. F. T. DAVIES has been appointed a director of Courtaulds, Ltd.

MR. H. S. BLACKMAN, who has for many years been connected with Barrow, Hepburn and Gale, Ltd., tanners, has now joined the board.

MR. P. F. HOLT, of Leicester, has been awarded the diploma of the Imperial College of Science, London, for a research thesis on dangerous dusts.

MR. JOHN H. MELVILLE, head of the chemistry department at George Heriot's School, Edinburgh, retired on July 21, after 51 years in the teaching profession.

VISCOUNT FEILDING, of Newnham Paddox, Rugby, chairman of Vitamins, Ltd., the Bussey Coal Distillation Co., Ltd., and a director of a number of other companies, only son of the Earl of Denbigh, left £164,836 (net personalty £50,780).

MR. S. SIMMONDS, Commercial Secretary at Tehran, has become Commercial Secretary at Moscow, in succession to Mr. G. P. Paton, who has been appointed H.M. Consul-General at Istanbul.

MR. SQUIRE TAYLOR, managing director of J. Fraser Ashworth, Ltd., chemical manufacturers, of Radcliffe, and formerly manager of John Whitehead's Elton Bleachworks, Bury, died at Bury on July 26. He was a member of the Lancashire County Council.

MR. W. S. GILLES, F.I.C., F.C.S., has been awarded the Fellowship of the City and Guilds of London Institute (F.C.G.I.). The fellowship is conferred upon those who having obtained the associateship of the Institute and have spent at least five years in actual practice, produce evidence of having done some original and valuable research work, or of having otherwise contributed to the advancement of the industry in which they are engaged.

SIR P. C. RAY, the well-known Indian scientist, has retired from the Palit Professorship of Chemistry, Calcutta University as from July 1. He has occupied this post since 1916. Since 1922 his salary, in agreement with his desire, was funded for the furtherance of the study of and research in chemistry at the University College of Science. Sir Prafulla founded the Bengal Chemical and Pharmaceutical Works and has since kept up his connection with that firm. It is the largest concern of its type in India.

PROFESSOR GELISSEN, who recently resigned from the post of Minister of Trade, Industry and Shipping in Holland, gave an address at Amsterdam last week on the significance of the chemical industry for Holland. He pointed out that there was over one hundred million Dutch florins invested in the Dutch chemical industry, and that about 50 per cent. of the exports went to West Europe, 16 per cent. to North and Central America, and 11 per cent. to East and Central Europe. Nearly one-half of the exports were oils, fats and allied products, *i.e.*, soap, candles and glycerine. Fertilisers were also exported in large quantities.

MR. H. G. SPICER, chairman of Spicer's, Ltd., paper manufacturers, who has been spending a holiday in the china clay district of St. Austell, visited the firm's works at Carpalla on July 22. This was the first occasion for 21 years, and to celebrate the event Mr. Spicer announced that in future the men employed on the works would be given a week's holiday with pay. Mr. Hedley T. Dingle presented Mr. H. G. Spicer with a silver cigarette casket full of cigarettes as a memento of their visit. The Carpalla china clay works which have been operated by Spicer's Ltd. for many years became famous in 1910 when the former company succeeded in winning an important law suit with the Great Western Railway, and Lord Moulton declared in the House of Lords that china clay was a mineral. This action resulted in the deviation of the railway which formerly went through the works. In 1933 the Duke of Windsor (then Prince of Wales) paid a surprise visit to the works.

MR. W. HOUGH, H.M. Consul-General at Istanbul, has become Commercial Secretary at Prague.

MR. D. G. EVANS has been appointed to the post of assistant lecturer in chemistry in the Department of Bacteriology at Manchester University.

MR. HENRY TERREY has been given the title of Reader in Chemistry in the University of London, in respect of the post held by him at University College.

MR. G. E. R. DEACON, of King's College, London, and MR. B. S. HARTLEY, of University College, London, have been awarded the degree of D.Sc. in chemistry.

LEUT.-COL. D. S. MORTON, a partner in the firm of Williamson, Morton and Co., paint manufacturers, of Glasgow, has left personal estate to the value of £75,744.

MR. AND MRS. ANDREW PORTEOUS, of Addiewell, West Calder, celebrated their diamond wedding last week. Mr. Porteous entered the employment of Young's Oil Co. over 50 years ago.

MR. THOMAS HERD, who since 1935 has been sole managing director of the Distillers Co., Ltd., of Edinburgh, died at Broughty Ferry, Dundee, on Thursday. He was 64 years of age and became a director of the company in 1925, two years after joining the company from James Watson and Co., distillers of Dundee.

MR. GEORGE DOWNIE HARDIE, Labour M.P. for the Springburn Division of Glasgow, died at Manor House Hospital, Golders Green, on July 26, at the age of 63. He had been seriously ill for some time. His last interest was the Bill for the control of the sale of methylated spirits, and in the debate on that measure he was particularly eloquent on the effects of this evil in Glasgow.

SIR CHARLES EDWARD SAUNDERS, whose discovery and development of Marquis wheat was largely responsible for the rise of Western Canada as the leading exporter of hard spring wheat in the world, died in Toronto, on July 25, at the age of 70. Born at London, Ontario, he was educated as a chemist and geologist at Toronto University, at Johns Hopkins University, and at Harvard University. He became professor of chemistry and geology at Central University, Kentucky. Ill-health forced him to retire at the age of 58 from the post of Dominion Cerealists. He was knighted in 1934.

MR. W. E. LE B. DIAMOND, Ph.D. (Cantab), A.I.C., has been appointed to the position of assistant secretary to the Institution of Gas Engineers. Dr. Diamond, who is 38 years of age, was educated at Christ's Hospital, Horsham, and Clare College, Cambridge. He was awarded the degree of Ph.D. for research in agriculture. Having held teaching and research posts at Cambridge and Government appointments in Nigeria and Ceylon, Dr. Diamond has been, since 1931, on the staff of the Royal Society where he has been in charge of all the publications of the Society.

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## Mining Without Explosives

### Suggested Use of Carbon Dioxide

THE practicability of an alternative to the use of explosives in coal mining is the subject of a special report to the Institution of Mining Engineers, whose 100th general meeting opened in Birmingham on July 21.

For eighteen months a committee have been inquiring into alternatives, and one of the methods proposed is the employment of liquid carbon dioxide, which, by means of a fuse, is transformed into gas at a pressure high enough to bring down the coal. The committee's report, it is suggested, may well revolutionise an important branch of mining practice. The part which explosives play in mining can be estimated from the fact that 25,000,000 lb. are consumed annually in the coal mines of Britain.



## Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

### Applications for Patents

PRODUCTION OF ARTICLES FROM HIGHLY POLYMERISED SUBSTANCES.—Siemens and Halske, A.-G. (Germany, July 9, '36.) 19043.  
LUBRICATING OIL ANTI-OXIDANTS.—Standard Oil Development Co. (United States, Aug. 1, '36.) 18963.  
PRODUCTION OF ESTERS OF *p*-NITRO BENZOIC ACID.—Soc. des Usines Chimiques Rhone-Poulenc, R. Mayer and C. Oechslin. 19529.  
MANUFACTURE OF INTERMEDIATE PRODUCTS and dyestuffs therefrom.—Soc. of Chemical Industry in Basle. (Switzerland, July 14, '36.) 19520.  
MANUFACTURE OF INTERMEDIATE PRODUCTS and dyestuffs therefrom.—Soc. of Chemical Industry in Basle. (Switzerland, July 13.) 19521.  
LUBRICATING OIL ANTI-OXIDANTS.—Standard Oil Development Co. (United States, Aug. 21, '36.) 18954-18965.  
CEMENT.—Standard Oil Development Co. (United States, July 25, '36.) 19026.  
MANUFACTURE OF SOAP.—Supercentrifugal Engineers, Ltd. 19438.  
PRODUCTION OF THERAPEUTICALLY, ETC., ACTIVE SUBSTANCES.—Syngala Fabrik für Chemisch-Synthetische und Galenische Arzneimittel Ges. (May 2, '36.) 19299.  
PRODUCTION OF WIDE-POROUS ACTIVE SILICIC ACID.—O. Zumstein. 19250.  
DECONTAMINATION OF POISONED AIR.—E. Berl. 19721.  
SMOKE-ABATEMENT TREATMENT FOR COAL.—E. Berl. 20154.  
REMOVAL OF POISONOUS SUBSTANCES FROM AIR.—E. Berl. 20155.  
PRODUCTION OF WATER-SOLUBLE CARBOHYDRATES.—E. Berl. 20156.  
MANUFACTURE OF VAT DYE-STUFFS.—A. Carpmal (I. G. Farbenindustrie.) 20091.  
MANUFACTURE OF FERTILISERS.—J. A. Coombs. 18896.  
LUMINOUS PAINT.—R. Eastman. 19842.  
REFINING HYDROCARBON OILS.—Edeleanu Gas. (Germany, July 16, '36.) 19745.  
PRODUCTION OF ARTIFICIAL POLYMERISABLE MATERIALS.—J. P. Fraser. 19615.  
MANUFACTURE OF ARTIFICIAL LEATHER.—W. W. Groves (Deutsche Celluloid-Fabrik). 19625.  
MANUFACTURE OF SULPHONATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) 19622.  
MANUFACTURE OF CORTICAL HORMONES.—W. W. Groves. 19623.  
MANUFACTURE OF PHYSIOLOGICALLY ACTIVE PREPARATIONS.—W. W. Groves. 20215.  
HARDENING OF PROTEIN SUBSTANCES.—W. W. Groves. 20219.  
MANUFACTURE OF VINYL KETONE.—I. G. Farbenindustrie. (Germany, July 24, '36.) 19846.  
MANUFACTURE OF VINYL METHYL KETONE.—I. G. Farbenindustrie. (Germany, May 22.) 19847.  
MANUFACTURE OF PENTAMETHINE-ALDEHYDE HETEROCYCLIC GASES.—I. G. Farbenindustrie. (Germany, Aug. 29, '36.) 20216.  
MANUFACTURE OF BUTADIENE.—I. G. Farbenindustrie. (Germany, July 24, '36.) 20221.  
MANUFACTURE OF ACID WOOL DYE-STUFFS.—I. G. Farbenindustrie. (Germany, July 29, '36.) 20238.  
MANUFACTURE OF COLOURING MATTERS.—Imperial Chemical Industries, Ltd., and C. E. Dent. 19796.  
EXTRACTION OF FISH OILS.—Imperial Chemical Industries, Ltd. 19994.  
CHROME MORDANT PRINTING.—Imperial Chemical Industries, Ltd. 20079.  
MANUFACTURE OF NITROAMINO COMPOUNDS.—Imperial Chemical Industries, Ltd., P. G. Carter, and J. L. Grieve. 20239, 20240.  
MANUFACTURE OF NITRO COMPOUNDS.—Imperial Chemical Industries, Ltd., P. G. Carter, and J. L. Grieve. 20241.  
MANUFACTURE OF DISAZO LEATHER DYES.—Imperial Chemical Industries, Ltd., and M. Mendoza. 20242.  
MANUFACTURE OF PRODUCTS comprising dextrose.—International Patents Development Co. (United States, July 31, '36.) 19793.  
MANUFACTURE OF STARCH.—L. Mellersh-Jackson. (Merco Centrifugal Co.) 20073.  
WORKING UP OF WASTE GASES from the destructive hydrogenation of coals, etc.—G. W. Johnson (I. G. Farbenindustrie.) 19657.  
CATALYTIC POLYMERISATION OF OLEFINS.—G. W. Johnson (I. G. Farbenindustrie.) 19658.  
MANUFACTURE OF VALUABLE LIQUID HYDROCARBONS.—G. W. Johnson (I. G. Farbenindustrie.) 19659.  
REDUCTION OF UNSATURATED COMPOUND.—G. W. Johnson (I. G. Farbenindustrie.) 19776.  
MANUFACTURE OF CONCENTRATED NITRIC ACID.—G. W. Johnson (I. G. Farbenindustrie.) 19778.  
MANUFACTURE OF HIGHLY CONCENTRATED OLEFINS.—G. W. Johnson (I. G. Farbenindustrie.) 19779.  
RECOVERY OF HIGH MOLECULAR WEIGHT CARBOXYLIC ACIDS, ETC.—G. W. Johnson (I. G. Farbenindustrie.) 19949.

REMOVAL OF FOREIGN GASES from the circulating gases of catalytic pressure reactions.—G. W. Johnson (I. G. Farbenindustrie.) 19777.  
APPARATUS FOR THE FINE FRACTIONATION OF DISTILLABLE MIXTURES.—G. W. Johnson (I. G. Farbenindustrie.) 19950.  
SEPARATION OF SOLID SUBSTANCES from oil residues.—G. W. Johnson (I. G. Farbenindustrie.) 20222.  
MANUFACTURE OF SYNTHETIC RESINS.—Kodak, Ltd. (Eastman Kodak Co.) 19656.  
MANUFACTURE OF SOAP.—A. MacBroom. 19713.  
PROCESS FOR CARRYING OUT ENDOTHERMIC CHEMICAL REACTIONS of organic compounds.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (United States, July 20, '36.) 19797.  
MANUFACTURE OF LUBRICANTS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Holland, July 24, '36.) 19996.  
PRODUCTION OF ACID OILS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (United States, July 21, '36.) 19997.  
DISTILLATION OF TAR.—T. Ness, Ltd., and O. Reynard. 19727.  
MANUFACTURE OF GLYCOPROTEIN PRODUCTS.—Y. Oyamada, and S. Tanaka. 20103.  
EXTRACTION OF FISH OILS.—H. E. Parker. 19994.  
TEMPERATURE REGULATION in the treatment of distillable carbonaceous materials with hydrogenating gases.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). 19581.  
MANUFACTURE OF SUPERPHOSPHATE, ETC.—Pratchitt Bros., Ltd., and W. M. Pratchitt. 19870.  
AROMATIC POLYETHER AMINES.—Röhm and Haas, A.-G. (United States, July 31, '36.) 20051.  
TREATMENT OF ORE, ETC., containing iron and titanium.—E. Scherf (Hungary, July 30, '36.) 19947.  
PRODUCTION OF CALCIUM PHOSPHATES, ETC.—W. Siegel. 19990.  
MANUFACTURE OF SOAP.—A. H. Smith and R. Smith. 19713.  
PRODUCTION OF PARAFFIN.—Studieu-und Verwertungs-Ges. (Germany, Aug. 1, '36.) 19878.  
PRODUCTION OF REGULINE BERYLLIUM.—W. H. A. Thiemann (I. G. Farbenindustrie.) 19799.  
EXTRACTION OF FISH OILS.—H. Tudor. 19994.  
TREATMENT OF OILS.—F. Uhde. (Germany, July 15, '36.) 19682.  
MANUFACTURE OF MONOVINYLAETHYLENE.—Dr. A. Walker Ges. für Elektrochemische Industrie, Ges. (Germany, July 17, '36.) 19746.

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METHOD OF PRODUCING SOLUTIONS of compounds of high molecular weight.—I. G. Farbenindustrie. Jan. 17, 1936. 33928/36.  
MANUFACTURE OF ORTHO-OXY-AZO DYE-STUFFS.—I. G. Farbenindustrie. Jan. 17, 1936. 33929/36.  
MANUFACTURE OF WETTING, SUDSING, EMULSIFYING and detergent agents.—Procter and Gamble Co. Jan. 18, 1936. 34893-4/36.  
PIGMENT.—Burgess Titanium Co. Jan. 13, 1936. 35260/36.  
PROCESS AND APPARATUS FOR THE CATALYTIC TREATMENT OF HYDROCARBONS and the regeneration of the catalyst used therein.—Houdry Process Corporation. Jan. 13, 1936. 35272/36.  
PROCESS FOR REGENERATING WASTE SULPHURIC ACID.—Cellulose Patents (International), Ltd. Jan. 14, 1936. 35502/36.  
PROCESS FOR DYEING FIBRES OF CELLULOSE or regenerated cellulose alone or in admixture with other fibres.—I. G. Farbenindustrie. Jan. 18, 1936. 35724/36.  
PROCESS FOR MAKING CONDENSATION PRODUCTS.—F. Keil and W. Dobke. Jan. 13, 1936. 1086/37.  
PRODUCTION OF LYNXIN-LIKE PRODUCTS.—Naamlooze Vennootschap Industriele Maatschappij Voorheen Noury and van der Lande. Jan. 15, 1936. 1161/37.  
WATER-SOFTENING INSTALLATIONS.—Chemische Fabrik Budenheim, A.-G. Jan. 17, 1936. 1187/37.  
MANUFACTURE OF THE SUBSTANCE PROMOTING LACTATION from the anterior lobes of the hypophysis.—I. G. Farbenindustrie. Jan. 15, 1936. 1261/37.  
MANUFACTURE OF ACTIVE EXTRACTS of the anterior lobes of the hypophysis.—I. G. Farbenindustrie. Jan. 18, 1936. 1262/37.  
MANUFACTURE OF PLASTIC MASSES and shaped articles therefrom.—I. G. Farbenindustrie. Jan. 16, 1936. 1263/37.  
PRODUCTION OF A CRIMPED VOLUMINOUS TEXTILE FIBRE from viscose.—Vereinigte Glanzstoff-Fabriken, A.-G. Jan. 15, 1936. 1308/37.  
MANUFACTURE OF FORMYLAMINOANTHRAQUINONES.—E. I. du Pont de Nemours and Co. Jan. 18, 1936. 1320/37.  
PROCESS FOR PRODUCING FINE-GRAIN PHOTOGRAPHIC PICTURES.—I. G. Farbenindustrie. Jan. 18, 1936. 1464/37.  
ANTHRAQUINONE DERIVATIVES and their manufacture.—E. I. du Pont de Nemours and Co. Jan. 18, 1936. 1525/37.  
PROTEIN DERIVATIVES.—E. I. du Pont de Nemours and Co. Jan. 17, 1936. 1529/37.

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MANUFACTURE OF COMPOSITIONS containing cellulose derivatives and of shaped structures therefrom.—Dr. L. Lilienfeld. Oct. 11, 1935. 469,007.

PRODUCTION OF MULTI-COLOUR PHOTOGRAPHIC PICTURES.—W. W. Groves (I. G. Farbenindustrie.) Oct. 12, 1935. 468,946.

NICKEL AND NICKEL ALLOYS.—L. B. Pfeil. Oct. 15, 1935. 468,948.

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DISINFECTANTS and the like.—W. J. Tennant (Henkel and Cie Ges.). Dec. 5, 1935. 468,832.

PRODUCTION OF TERPINEOL from pinene.—Hercules Powder Co. Jan. 9, 1935. 468,785.

ANTIOXIDANTS FOR RUBBER.—W. Baird, R. F. Goldstein, M. Jones, E. M. Meade and Imperial Chemical Industries, Ltd. Dec. 12, 1935. 468,787.

METHOD OF PRODUCING INTENSIFIED FRUIT or vegetable juice preparations.—W. W. Triggs (Beau May Process Corporation). Dec. 13, 1935. 469,011.

MANUFACTURE OF (N-DIHYDRO)-AZINES of the anthraquinone series.—W. W. Groves (I. G. Farbenindustrie). Jan. 13, 1936. 469,016.

MANUFACTURE OF AZO-DYESTUFFS.—I. G. Farbenindustrie. Feb. 16, 1935. 468,840.

METHOD AND DEVICE FOR TREATING THIXOTROPES.—I. G. Farbenindustrie. Jan. 18, 1935. 468,841.

PRODUCTION OF MEANS FOR WASHING, emulsifying, moistening, and preventing the formation of insoluble soaps.—Dr. A. Ofner. May 31, 1935. 468,956.

COLOUR PHOTOGRAPHY.—W. W. Groves (I. G. Farbenindustrie.) Jan. 14, 1936. 468,848.

PROCESS FOR THE MANUFACTURE OF ELASTIC ARTIFICIAL MASSES prepared by the interaction of polysulphides and dihalogenated hydrocarbons.—Silesia, Verein Chemischer Fabriken. Nov. 29, 1935. 468,896.

FUNGICIDAL AND BACTERICIDAL AGENTS.—S. Ellingworth, L. A. Elson, and Imperial Chemical Industries, Ltd. Jan. 15, 1936. 469,022.

MANUFACTURE OF MONONITROALKYLANILINES, mononitroalkylacylanilines and derivatives thereof.—S. Coffey, N. H. Haddock, and Imperial Chemical Industries, Ltd. Jan. 15, 1936. 469,080.

SAPONIFICATION OF ORGANIC ESTERS OF CELLULOSE and of filaments, films, and the like made therefrom.—British Celanese, Ltd., G. H. Ellis, and A. J. Wesson. Jan. 16, 1936. 469,025.

MANUFACTURE OF AZO-DYESTUFFS soluble in water.—W. W. Groves (I. G. Farbenindustrie.) Jan. 16, 1936. 469,081.

WORKING UP OF ASPHALTS or substances consisting of or containing asphalt-like materials.—G. W. Johnson (I. G. Farbenindustrie.) Jan. 18, 1936. 469,036.

DEGREASING METAL STRIP.—S. B. Spencer, J. C. Dutton, and Imperial Chemical Industries, Ltd. Jan. 16, 1936. 469,027.

REMOVAL AND RECOVERY OF ACIDIC GASES.—Robinson Bros., Ltd., D. W. Parkes, and R. B. Evans. Jan. 20, 1936. 468,972.

PROCESS FOR PRODUCING ANTI-DETONATING FUELS by the heat treatment of hydrocarbon mixtures.—Ruhchemie, A.-G. Jan. 28, 1935. 469,044.

MANUFACTURE AND PRODUCTION OF AN OIL of high boiling point suitable as a heating oil or motor fuel.—G. W. Johnson (I. G. Farbenindustrie.) Feb. 14, 1936. 469,048.

DYEING OF CELLULOSE ESTERS OR ETHERS.—L. S. E. Ellis (Soc. Rhodiaceta). Feb. 24, 1936. 468,863.

MANUFACTURE OF CHLORINE DERIVATIVES of unsaturated hydrocarbons.—E. I. du Pont de Nemours and Co., and O. W. Cass. March 2, 1936. 469,051.

PROTEIN FOOD COLOUR and method of producing same.—H. E. Allen and A. G. McCaleb. April 1, 1935. 469,055.

TREATMENT OF ALKALINE SOLUTIONS.—A. Kelly. April 3, 1936. 469,056.

METHODS AND APPARATUS FOR DESTROYING OR QUENCHING FROTH produced in the manufacture of yeast and like processes.—J. O. Naucner. June 14, 1935. 469,058.

PROCESS FOR SIMULTANEOUSLY OBTAINING KRYPTON and nitrogen from air.—L. Mellersh-Jackson (Soc. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude). May 11, 1936. 468,872.

PREPARATION OF EDIBLE EMULSIONS.—H. C. Lundsgaard. May 25, 1936. 468,810.

PREPARATION OF CELLULOSE XANTHATE OXIDE.—Brown Co. Aug. 20, 1935. 468,993.

METHOD OF PRODUCING ALUMINIUM OXIDE.—A. S. Burman. July 29, 1935. 469,061.

PROCESS AND PRODUCT for obtaining rapid coagulation of rubber. Celsa Holding Soc. Anon. Sept. 20, 1935. 468,910.

STABILISATION OF CELLULOSE ESTERS.—Afa Finanzierungs, A.-G. Oct. 9, 1935. 468,880.

MANUFACTURE OF PERCHLOROETHYLENE.—Dr. A. Wacker Ges für Elektrochemische Industrie Ges. Dec. 12, 1935. 468,921.

STARTING-CIRCUIT for gas or vapour filled electric discharge devices.—Vanovia Chemical and Manufacturing Co. May 23, 1936. 468,822.

PROCESS OF AND APPARATUS FOR RECOVERING SOLVENTS from the outgoing air of lacquer spraying devices.—Carbo-Norit-Union Verwaltungs-Ges. Jan. 29, 1936. 469,001.

PROCESS AND APPARATUS FOR THE TREATMENT OF DRIED CASSAVA ROOTS to obtain starch.—L. P. Heltne. Dec. 30, 1935. 468,926.

FILTERS FOR SEPARATING AEROSOLS from air.—Soc. Italiana Pirelli. Dec. 28, 1935. 468,930.

ANTI-FREEZING AGENTS or compositions.—Henkel and Cie, Ges. April 17, 1936. 468,829.

## Chemical and Allied Stocks and Shares

ALTHOUGH no large improvement of business was reported in the stock and share markets this week, various sections of the Stock Exchange showed a much better tendency, buyers being more in evidence on the belief that when holiday influences are out of the way, share prices may show a general advance.

Imperial Chemical again attracted chief attention among shares of companies connected with the chemical and kindred industries. As compared with a week ago there has been a further rise from 37s. 6d. to 38s. 1½d. in response to current market views of dividend prospects, reference to which was made last week. Boots Pure Drug also improved further to 52s. aided by the belief that, having regard to the particularly strong balance sheet position and high earning capacity, shareholders must sooner or later participate to a larger extent in the company's prosperity, either by way of a scrip bonus or an increase in dividend. Timothy Whites and Taylors were also favoured, there having been a rise on the week from 32s. 1½d. to 34s. 6d. on market expectations of a higher rate of dividend, the assumption being that earnings are benefitting from the measure of internal reorganisation, referred to at the last meeting. Beechams Pills deferred shares were again active around 69s. 6d. and Sangers held up well at 26s. 3d.

There was again increased demand for shares with an international market. Unilever moved up from 40s. 3d. to 41s. 1½d. and Unilever N.V. from 42s. 9d. to 44s. It may be recalled that at the last meeting it was indicated that plans may be drawn up for consolidating the companies in the group and that it was likely if a development of this kind were effected it would make for larger dividends for Unilever shareholders. International Nickel have risen further to \$65 on the belief that profits are continuing to advance. A minimum total dividend of \$2 per share continues to be expected in the market for the current

year; estimates range up to \$3 per share. Swedish Match at 25s. are virtually the same as a week ago.

British Plaster Board have declined from 35s. 9d. to 32s. Associated Portland Cement also reacted sharply at one time, but recovered, and at 90s. 7½d. are unchanged on balance. Borax Consolidated lost a few pence to 30s. 3d., as did General Refractories, which are 27s. 7½d. at the time of writing, compared with 28s. a week ago. Reckitt and Sons ordinary transferred around 107s. The yield is not large on the basis of the 22½ per cent. dividend which has been paid for many years, but this has to be read in relation to the strong financial position, which, according to some market views, justifies the hope of a bonus of some kind as time proceeds. Goodlass Wall and Lead Industries, 10s. ordinary were maintained at 12s. 7½d. Last year's dividend of the last-named company was 7 per cent., but actual earnings on the ordinary capital worked out at 10½ per cent. Other paint shares were also well maintained in price, there being continued expectations that Pinchin Johnson, International Paint and Indestructible Paint will make no change in their forthcoming interim dividends.

B. Laporte were around 106s. at which a satisfactory yield is offered. Last year's dividend was 22½ per cent., but if a further large sum had not been added to reserve and the carry forward increased, the dividend could have been 16½ per cent. higher. Newton Chambers were again 60s. at Sheffield. This company also has an excellent dividend record, and last year's higher payment of 15 per cent. represented a conservative treatment of profits. Monsanto Chemical 5½ per cent. preference again changed hands up to 23s. 3d.

Oil shares lost an earlier advance, and there was a sharp reaction in "Shell," Anglo-Iranian and Trinidad Leaseholds on the unexpected reduction in the price of petrol.

## From Week to Week

A FITTER'S LABOURER, John Foxhall (42), died as a result of having been overcome by gas fumes at a blast furnace at West Hartlepool last week.

VALUABLE INSTRUMENTS WERE SAVED when fired destroyed the scientific room and workshop at the Slough station of the Imperial College of Science and Technology on July 22.

THE ROYAL COMMISSION<sup>ON INVENTIONS</sup> will shortly issue their final report. The last formal hearing before the Commission took place some three and a half years ago.

SANGERS, LTD., have increased their nominal capital by the addition of £50,000 beyond the registered capital of £1,250,000. The additional capital is divided into 200,000 ordinary shares of 5s. each.

THE NECESSITY FOR RESEARCH IN INDUSTRY was emphasised at a luncheon of the Research Association of British Rubber Manufacturers, held at the Trocadero Restaurant, London, on July 21, following the annual general meeting of the association. The newly-elected president, Sir Harold Hartley, presided.

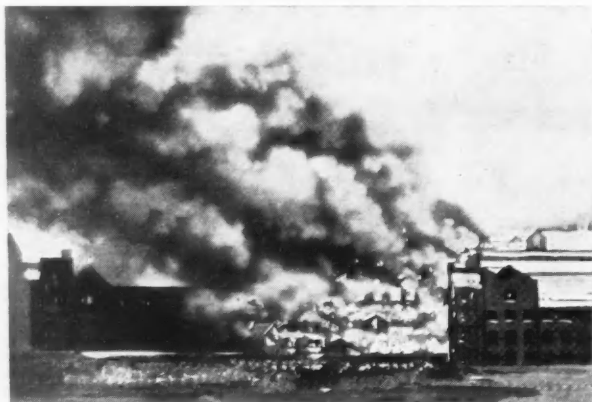
STRUCK BY A HEAVY MASS OF CARBON DIOXIDE freezing mixture which fell from a preparation tower at an ice-cream factory at Acton, Thomas E. Wettome, a 26-year-old employee, of Munster Road, Fulham, received severe injuries. The accident occurred when he stepped under a 14 ft. high tower to dislodge the solidified gas, which is prepared for packing ice cream.

ACCORDING TO A FRENCH DECREE, dated June 18, the "temporary admission" system (under which goods may be imported into France temporarily duty-free for working up and subsequent re-export) has been extended to apply to petroleum oils, derivatives and residues, for use in the manufacture of insecticides or anticyptogamic products intended for export.

FRENCH TRADE IN THE FIRST HALF OF 1937 was considerably better than in the corresponding period of last year. Imports amounted to 20,282,000,000 frs. (£184,381,800 at 110 to the £), compared with 11,949,000,000 frs. (£108,627,270) in the corresponding period of 1936. Exports totalled 11,035,000,000 frs. (£100,318,000) compared with 7,204,000,000 frs. (£65,500,000), 1936.

EXPORTS FROM RUSSIA during the first half of 1937 amounted to 634,600,000 gold roubles, roughly equivalent to £25,400,000. This represents an increase of over 12 per cent. compared with the same period in 1936. Imports totalled 673,800,000 gold roubles, roughly £26,000,000, an increase of less than 2 per cent. Exports of manganese ore were more than doubled, increasing in value by £452,000. Imports of chemicals declined by £160,000.

ONE OF THE WORST FIRES IN NEWCASTLE for many years, destroyed the paint works of J. Dampney and Co., Ltd., Portland Road, Shieldfield, on July 25. Only the company's offices escaped, and the total damage is estimated to be £150,000. About



600 men will be temporarily out of employment as a result of the fire, which also caused considerable damage to Shieldfield Council School on the opposite side of the road. Large quantities of linseed oil and paint, and about 20,000 gallons of turpentine, assisted the flames. The full strength of the Newcastle fire brigade, including eight engines, was called out.

INCREASES IN RAILWAY CHARGES, which have been sanctioned by the Railway Rates Tribunal, will have the effect of producing substantially the sum of £5,600,000 additional revenue which the companies sought the consent of the Tribunal to obtain. The increased charges for coal and general merchandise will be as follows: On existing charges not exceeding 2s. 5d. an increase of 1d.; over 2s. 5d. and not exceeding 4s. 1d., 2d.; over 4s. 1d. and not exceeding 5s. 10d., 3d.; thereafter 1d. increase for each additional 1s. 8d. subject to the exception mentioned above.

THE WORKS FORMERLY OCCUPIED BY DOULTON, LTD., at Hawkhead, Paisley, have been acquired by A. Bell and Sons, Ltd., dyers and cleaners.

CELLULOSE ACETATE SILK CO., LTD., passed a special resolution at an extraordinary meeting held on July 26, changing the name of the company to Lansil, Ltd.

THE YEARLY PILGRIMAGE OF THE EMPLOYEES of Thos. Hill-Jones, Ltd., to Southend-on-Sea, took place on July 17. The chairman of the company is Mr. W. S. Lloyd-Willey.

THE LINDE AIR PRODUCTS CO., a unit of Union Carbide and Carbon Corporation, is starting upon the construction of a large plant for the production of oxygen in South Chicago.

THE BENN W. LEVY RESEARCH STUDENTSHIP in biochemistry, at Cambridge, will become vacant on October 1. Applications for its tenure should be addressed to Sir F. Gowland Hopkins at the School of Biochemistry before July 24.

PLANS OF A PROPOSED CEMENT WORKS have been deposited with the Plympton Rural District Council. It is understood that the lessees of the site are a Gravesend firm, which is now producing a cement composed largely of river mud.

SEVERE DAMAGE was caused by a fire which destroyed part of the works of Amalgamated Oxides, Ltd., Victoria Wharf, Dartford, early on Thursday. Valuable machinery and hundreds of bags of zinc oxide were badly damaged. The Dartford Fire Brigade had the outbreak under control within two hours.

THE TRUSTEES OF THE FUND OF £200,000 to be provided by Sir John Jarvis, M.P., to promote employment in special areas on Tyne-side, are announced as the Earl of Middleton, Colonel Stuart Pleydell-Bouverie, and Mr. Philip Peebles. The secretary will be Mr. W. G. Smeeton, 2 Guildhall Chambers, E.C.2.

THE SANITARY INSPECTORS ASSOCIATION, of which Sir Leonard Hill, F.R.S., is president, will hold their Jubilee Conference at Brighton, August 30 to September 4. Included among subjects for discussion are: "Factories Legislation" (introduced by Mr. G. D. Kirby, Norwich), and "Grit Emission" (introduced by Mr. A. W. Tyler, of Bath).

THE COMMITTEE FOR FIXING STANDARD PRODUCTION RATES of quinine estates in the Dutch Indies has been studying the question of arranging a new basis. For the current year the Indies Department of Economic Affairs has already issued licences for a production equivalent to 60 per cent. of the quotas for last year. Others will follow up to 70 and 80 per cent.

SCARLET CHROME 20225 is an important new addition to the I.C.I. range of chrome colours. It has been specially designed for printing ink colours. Its great opacity makes it particularly valuable for the preparation of inks for printing on dark or coloured papers and for transparent material such as viscose films. Other uses for the product are in the manufacture of paints and the colouring of nitrocellulose lacquers.

A FORMAL VERDICT WAS RETURNED by a jury at Edinburgh Sheriff Court on July 22, when a fatal accident inquiry was held into the cause of an outbreak of fire at the works of the Pumpherston Oil Co. on May 28 last, when William Dorman, 87 Works Row, Pumpherston, was fatally injured. In the course of evidence, Mr. John Caldwell, assistant manager of the company, said there was no definite evidence as to what caused the explosions.

DURING MERCHANT NAVY WEEK at Southampton Docks, an exhibition was staged to show the dependence of British industry on shipping. At the exhibition Courtaulds, Ltd., showed how imported spruce chips were reduced to viscose and thence to cellulose threads and sheets, and delustrated and dyed in the manufacture of rayon. The Coal Utilisation Council, in collaboration with Southampton Gaslight and Coke Co., showed how naphthalene, benzol, synthetic perfumes, dyes and drugs are derived from coal.

PROGRESS MADE UNDER THE INDUSTRIAL ALCOHOL ACT, 1934, is recorded in a report for the year ended March 31 last, which has been laid on the table of the Free State Dail. The work of construction and equipment of the five industrial alcohol factories was virtually completed by the end of the period under review. Preliminary arrangements which had been made with the French firm of Usines de Melle, to enable their patented process of alcohol dehydration to be used in the five factories have been embodied in a formal agreement.

THE UNITED KINGDOM GAS CORPORATION has just completed purchase of over 90 per cent. of the ordinary share capital of Aberdare and Aberaman Consumers' Gas Co., which adjoins group of gas undertakings in South Wales already owned by the corporation. Over 50 per cent. of the purchase price of £38,243 was satisfied by ordinary shares of U.K. Gas. During this week the Corporation will be completing the purchase of over 90 per cent. of the 5 per cent. consolidated ordinary stock of the Leighton Buzzard Gas Co., which adjoins the Corporation's gas undertaking at Aylesbury, at a cost of £61,210.



THE ARTHUR LIE CHEMICAL CO. is to establish a soap-boiling business at a disused creamery near Lugton, Ayrshire.

ITALIAN EXPORTS OF RAYON YARN (excluding staple fibre) in the first five months of 1937 totalled 11,038 tons, against 7,069 tons in the corresponding period of 1936, when "sanctions" were in force.

THE UPSWING IN THE EXPORT BUSINESS of Czechoslovakia during the first half of 1937 has been favourable to the preparatory work for the forthcoming Autumn Fair in Prague, September 3-12. The number of exhibitors will be about 3,000.

THE TEST BOREHOLE which the Anglo-American Oil Co. are drilling in an attempt to find oil at Grove Hill, near the village of Hellingly in Sussex, has now reached a depth of 2,300 ft. Although the results so far are negative, the drill is now penetrating the Corallian Sands, and there is known to be a small seepage of crude oil where these geological strata come to the surface on the Dorset coast. The borehole, which is 22 in. in diameter at the top, decreases at intervals to 9 in. at the lowest depth so far reached.

THE PUBLIC SCHOOLS BUSINESS SOCIETY, founded in April, 1936, has now opened a club room at 29 Whitehall, S.W.1, for the use of members from 12.30 p.m. until 10.30 p.m. daily. The society has a steadily increasing membership among young men in business in London. Its activities include a debating and dramatic club, while meetings are organised throughout the winter at which addresses are given by prominent speakers on all phases of national life. The subscription of one guinea is kept especially low so as to encourage young men to join at the outset of their careers, when companionship, interests and encouragement are most needed.

## Company News

**English Velvet and Cord Dyers Association.**—Consideration of the dividend for half-year ended June 30 on 5 per cent. cumulative preference shares has been deferred until accounts for 1937 are available. Dividends are in arrears from January 1, 1935.

**Major and Co.**—The report for the year to March 31 last shows profit £5,135 (£4,491); debit balance brought forward was £7,157 and after providing for directors' fees £150, depreciation £1,501, bank interest £1,471 and tax £87, there remains debit of £5,232 carried forward.

**Inveresk Paper Co.**—The payment on September 1 of the dividend on the £1,499,950 of 6 per cent. first preference stock for the half-year ended June 30, 1937, is announced. This dividend has previously been paid yearly and this is the first half-yearly dividend since the reconstruction in 1933.

**British Coal Distillation.**—The report for the year to November 30 shows distillation plant expenses £8,675 (£9,549), London office, general and administrative expenses £4,033 (£3,006), interest on temporary loans and debentures £1,600 (£666), and directors' fees (of which £1,012 is unpaid) £1,350, making debit of £15,657, which, added to debit brought in, makes debit forward £76,818. Auditors' report states "Plant dismantled has been written off, but otherwise no depreciation has been written off buildings, fixed plant and sidings. We are unable to express opinion as to value of licences, rights and trade marks, and, in our opinion, present value of shareholding in Leicestershire Colliery and Pipe Company is still below figure at which it stands in books."

**British Benzol and Coal Distillation.**—This company is funding its outstanding indebtedness by issuing £100,000 5½ per cent. redeemable stock, of which £62,500 is being offered to shareholders and the balance has been placed firm by Dawney Day and Co., who have underwritten the entire issue. The company has just arranged a contract with the Newport (Mon.) Gas Co. for 20 years' supply of gas. This contract, it is stated, will produce annual payments of at least £11,000, which are to be paid direct to the Alliance Assurance Co. as trustee for the debenture holders for the service of the debenture stock. The new contract provides the company with additional profits of over £5,000 per annum. The debenture stock is redeemable not later than 1951 by the operation of a semi-annual sinking fund. Stock retired before July 1, 1942, will be redeemed at 102, after July 1, 1942, but before July 1, 1947, at 101, and thereafter at par. Shareholders have the right to take up £50 debenture stock in respect of every 100 shares held.

## New Companies Registered

**Henstridge Chemical Products, Ltd.**—Registered July 19. Capital £3,000 in 11,400 ordinary shares of 5s. and 1,500 founders' shares of 2s. each. To acquire the business of manufacturing wholesale chemists, etc., heretofore carried on by Walter E. Preston and Thomas B. Small at Henstridge, Somerset, as the "Henstridge Chemical Products Co." Directors: Alfred Smallwood, 13 Holyhead Road, Handsworth, Birmingham; Thomas B. Small, Walter E. Preston.

THE NATIONAL PETROLEUM DISTRIBUTING COMPANIES have announced a reduction of ½d. a gal. to 1s. 7d. in the price of motor spirit.

OUTPUT OF RAYON YARN AND WASTE reached a fresh peak in June at a total of 14,060,000 lb., according to the *Board of Trade Journal*. This is no less than 1,880,000 lb. more than in May and 1,740,000 lb. above the June, 1936, level. The previous high record was 13,810,000 achieved in July last year.

AN INTERNATIONAL COAL CONFERENCE, called by the International Labour Office, will be held in Brussels towards the close of the year. Eight Governments have so far agreed to be represented, among them those of Great Britain, France and Belgium. The participation of Germany is still in doubt. The conference will discuss, beside the more general problems of the coal industry, the question of shorter hours of work.

A PAPER ON THE NATURE AND PROPERTIES of para-aminobenzenesulphonamide in the treatment of erysipelas, meningitis, pneumonia and blood poisoning, was read by Mr. W. J. C. Dyke, a research worker, at the British Pharmaceutical Conference at Liverpool on July 27. Mr. T. Edward Lescher, chairman of the conference, said that this drug had proved to be one of the greatest discoveries of modern medicine.

ALUMINIUM IN THE TEXTILE INDUSTRIES is the subject of a new booklet issued by The British Aluminium Co., Ltd. The use of aluminium in equipment for processing, bleaching and dyeing has not been seriously tackled in this country. In America, however, the process benefits by the use of aluminium, this being found satisfactory in the presence both of hydrogen peroxide and of acid and acid chrome dyes. Aluminium does not catalyse the decomposition of hydrogen peroxide solutions.

**Pharmaceutical Supplies, Ltd.**—Registered July 15. Capital £100 in 100 ordinary shares of £1 each. To carry on business as pharmaceutical, manufacturing and general chemists and druggists, etc. Subscribers: Arthur K. Whitburn, 31 Basinghall Street, E.C.2, Alexander Y. Johnston.

**Modern Fuels, Ltd.**—Registered July 19. Nominal capital of £70,000 is 70,000 shares of £1. To adopt an agreement with Harry Lane of "Hollymount," Norton-on-Tees, and to carry on develop, extend and turn to account the Coal Carbonisation Works, Seaham Harbour, Durham, and the plant and machinery mentioned therein. Directors: Harry Lane, "Hollymount," Norton-on-Tees, Bebag Cohen, Gwynne Cellan-Jones.

**Glastic, Ltd.**—Registered July 19. Capital £50 in 100 shares of 10s. each. To carry on the business of manufacturers of and dealers in resinous, plastic, pliable, flexible, transparent or elastic material, etc. Directors: Wilhelm M. Behmisch, Leopold A. Heubach, Wallace W. Haffenden, Ralph O. Raphael, William Johnson. Secretary: Edward E. Morris. Registered office: 12 Well Street, E.C.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### Receivership

J. W. BARTON, LTD., chemists, druggists, chemical engineers, etc., 25 Westow Hill, S.E.19.—H. O. Barnsley, incorporated accountant, of 44 Bedford Row, W.C., was appointed receiver and/or manager on July 19, 1937, under powers contained in debentures dated April 3, 1936.

## Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

**South Africa.**—H.M. Trade Commissioner at Johannesburg reports that the Union Tender and Supplies Board is calling for tenders, to be presented in South Africa by August 27, 1937, for the supply and delivery of vaccine bottles. (Ref. T.Y. 25797/37.)

**Poland.**—A merchant established at Warsaw wishes to obtain the representation of United Kingdom manufacturers of drugs and pharmaceutical chemicals and shellac. (Ref. No. 65.)

## Books Received

**Modern Glass Working and Laboratory Technique.** By M. C. Nokes. Pp. 153. William Heinemann, Ltd. 7s. 6d.  
**A Text-Book of Inorganic Chemistry for University Students.** By J. R. Partington. Fifth edition. Pp. 1062. London: Macmillan and Co., Ltd. 15s.

## Weekly Prices of British Chemical Products

**T**HERE are no price changes to report in the markets for rubber chemicals, wood distillation products, tar products, perfumery chemicals, essential oils and intermediates. Unless otherwise stated, the prices below cover fair quantities net and naked at sellers' works.

**MANCHESTER.**—With a good many buyers absent on holidays, comparatively slow trading conditions so far as new bookings are concerned have been reported on the Manchester chemical market during the past week and the position in this respect will probably be worse during Bank Holiday week. On the whole, however, apart from these seasonal influences there is still a fairly steady flow of specifications for deliveries against contracts, these covering a wide range of both heavy and light materials. Bleaching, dyeing and other textile chemicals are being taken up in fair quantities locally. Values generally fully maintain their recent firmness. With regard to the coal tar products, signs are not wanting of somewhat easier conditions in

one or two departments where pronounced strength has been a feature for several months.

**GLASGOW.**—Business in general chemicals has been rather quiet during the week on account of the local holidays, and export business also has been limited. Prices, however, continue very steady at about previous figures with no important changes to report. Trading in coal tar products is being adversely affected by holiday influences, and conditions are likely to remain rather quiet until late August. High boiling tar acids have changed hands round 2s. 5d. per gallon f.o.r. sellers' tanks. Odd lots of cresylic acid have again been on offer at lower rates, but manufacturers are on the whole busy with forward contract commitments, and are holding out for top prices for any available surplus. Creosote is steady and supplies of specification oils are limited. Washed oil is about normal. Benzols and naphthas continue to move regularly against contracts with fresh prompt supplies difficult to obtain.

### General Chemicals

**ACETONE.**—£45 to £47 per ton.

**ACID, ACETIC.**—Tech., 80%, £30 5s. to £32 5s. per ton; pure 80%, £30 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. **MANCHESTER:** 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

**ACID, BORIC.**—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW:** Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

**ACID, CHROMIC.**—94d. per lb., less 2½%; d/d U.K.

**ACID, CITRIC.**—1s. per lb. **MANCHESTER:** 1s. **SCOTLAND:** B.P. crystals, 1s. per lb., less 5%, ex store.

**ACID, FORMIC.**—85%, in carboys, ton lots, £42 to £47 per ton.

**ACID, HYDROCHLORIC.**—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

**ACID, LACTIC.**—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50: pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

**ACID, NITRIC.**—80° Tw. spot, £18 to £25 per ton makers' works.

**ACID, OXALIC.**—£48 15s. to £57 10s. per ton, according to packages and position. **GLASGOW:** £2 9s. per cwt. in casks. **MANCHESTER:** £49 to £55 per ton ex store.

**ACID, SULPHURIC.**—168° Tw., £4 5s. to £4 15s. per ton; 140° Tw., arsenic-free, £2 15s. to £3 5s.; 140° Tw., arsenious, £2 10s.

**ACID, TARTARIC.**—1s. 1½d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. **MANCHESTER:** 1s. 1½d. per lb. **GLASGOW:** 1s. 1d. per lb.

**ALUM.**—Loose lump, £8 7s. 6d. per ton d/d; **GLASGOW:** Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

**ALUMINIUM SULPHATE.**—£7 per ton d/d Lancs.; **GLASGOW:** £7 to £8 ex store.

**AMMONIA, ANHYDROUS.**—Spot, 10½d. per lb. d/d in cylinders. **SCOTLAND:** 10d. to 1s. containers extra and returnable.

**AMMONIA, LIQUID.**—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

**AMMONIUM BICARBONATE.**—8d. per lb. d/d U.K.

**AMMONIUM CARBONATE.**—£20 per ton d/d in 5 cwt. casks.

**AMMONIUM CHLORIDE.**—LONDON: Fine white crystals, £16 10s. (See also Sal ammoniac.)

**AMMONIUM CHLORIDE (MURIATE).**—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Sal ammoniac.)

**ANTIMONY OXIDE.**—£55 10s. per ton.

**ARSENIC.**—LONDON: £13 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. **SCOTLAND:** White powdered, £17 ex store. **MANCHESTER:** White powdered Cornish £17 10s., ex store.

**BARIUM CHLORIDE.**—£10 per ton. **GLASGOW:** £11 5s. per ton.

**BISULPHITE OF LIME.**—£6 10s. per ton f.o.r. London.

**BLEACHING POWDER.**—Spot, 35/37%. £8 15s. per ton in casks, special terms for contracts. **SCOTLAND:** £9 per ton net ex store.

**BORAX COMMERCIAL.**—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. **GLASGOW:** Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

**CALCIUM CHLORIDE.**—Solid 70/75% spot, £5 5s. per ton d/d station in drums. **GLASGOW:** 70/75% solid, £5 10s. per ton net ex store.

**CHROMETAN.**—Crystals, 2½d. per lb.; liquor, £19 10s. per ton d/d

**COPPER SULPHATE.**—GLASGOW: £24 per ton.

**CREAM OF TARTAR.**—£3 19s. per cwt. less 2½%. **GLASGOW:** 99%, £4 12s. per cwt. in 5-cwt. casks.

**FORMALDEHYDE.**—£22 10s. per ton.

**GLYCERINE.**—Chemically pure, double distilled, 1.260 s.g., in tins, £5 7s. 6d. to £6 7s. 6d. per cwt. according to quantity; in drums, £5 to £5 13s. 6d.

**IODINE.**—Resublimed B.P., 5s. 1d. per lb.

**LEAD ACETATE.**—LONDON: White, £35 10s. per ton; brown, £35.

**GLASGOW:** White crystals, £34 to £35; brown, £1 per ton less. **MANCHESTER:** White, £36 10s.; brown, £36.

**LEAD NITRATE.**—£39 per ton.

**LEAD, RED.**—SCOTLAND: £38 per ton, less 2½%, carriage paid for 2-ton lots.

**LEAD (WHITE SUGAR OF).**—GLASGOW: £36 10s. per ton net, ex store.

**LITHARGE.**—SCOTLAND: Ground, £38 per ton, less 2½%, carriage paid for 2-ton lots.

**MAGNESITE.**—SCOTLAND: Ground calcined, £9 per ton, ex store.

**MAGNESIUM CHLORIDE.**—SCOTLAND: £7 10s. per ton.

**MAGNESIUM SULPHATE.**—Commercial, £5 per ton, ex wharf.

**MERCURY.**—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra.

**METHYLATED SPIRIT.**—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. **SCOTLAND:** Industrial 64 O.P., 1s. 9d. to 2s. 4d.

**PARAFFIN WAX.**—SCOTLAND: 3½d. per lb.

**PHENOL.**—7½d. to 8½d. per lb.

**POTASH, CAUSTIC.**—LONDON: £42 per ton. **MANCHESTER:** £40.

**POTASSIUM BICROMATE.**—SCOTLAND: 5d. per lb., net, carriage paid.

**POTASSIUM CHLORATE.**—£36 7s. 6d. per ton. **GLASGOW:** 4½d. per lb. **MANCHESTER:** £38 per ton.

**POTASSIUM IODIDE.**—B.P. 4s. 3d. per lb.

**POTASSIUM NITRATE.**—£27 per ton. **GLASGOW:** Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

**POTASSIUM PERMANGANATE.**—LONDON: 9½d. per lb. **SCOTLAND:** B.P. Crystals, 9½d. **MANCHESTER:** B.P. 11d. to 1s.

**POTASSIUM PRUSSATE.**—6½d. per lb. **SCOTLAND:** 7d. net, in casks, ex store. **MANCHESTER:** Yellow, 6½d.

**SALAMMONIAC.**—Firsts lump spot, £41 17s. 6d. per ton d/d in barrels. **GLASGOW:** Large crystals, in casks, £37.

**SALT CAKE.**—Unground, spot, £3 16s. 6d. per ton.

**SODA ASH.**—58% spot, £5 12s. 6d. per ton f.o.r. in bags.

**SODA, CAUSTIC.**—Solid, 76/77° spot, £12 10s. per ton d/d station. **SCOTLAND:** Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less.

**SODA CRYSTALS.**—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

**SODIUM ACETATE.**—£18 per ton carriage paid North. **GLASGOW:** £18 10s. per ton net ex store.

**SODIUM BICARBONATE.**—Refined spot, £10 10s. per ton d/d station in bags. **GLASGOW:** £13 per ton in 1 cwt. kegs, £11 per ton in 2-cwt. bags. **MANCHESTER:** £10 10s.

**SODIUM BICROMATE.**—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. **MANCHESTER:** 4d. per lb. **GLASGOW:** 4d., net, carriage paid.

**SODIUM BISULPHITE POWDER.**—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

**SODIUM CARBONATE, MONOHYDRATE.**—£15 per ton d/d in minimum ton lots in 2 cwt. free bags.

**SODIUM CHLORATE.**—£26 10s. to £30 per ton. **GLASGOW:** £1 10s. per cwt., minimum 3 cwt. lots.

**SODIUM CHROMATE.**—4d. per lb. d/d U.K.

**SODIUM HYPOSULPHATE.**—Commercial, 2 ton lots d/d, £10 5s. per ton; photographic, £15. **MANCHESTER:** Commercial, £10; photographic, £14 10s.

**SODIUM METASILICATE.**—£14 per ton, d/d U.K. in cwt. bags.  
**SODIUM NITRATE.**—Refined, £7 15s. per ton for 6-ton lots d/d.  
**SODIUM NITRITE.**—£18 5s. per ton for ton lots.  
**SODIUM PERBORATE.**—10%, 9½d. per lb. d/d in 1-cwt. drums.  
**SODIUM PHOSPHATE.**—£13 per ton.  
**SODIUM PRUSSIAN.**—4d. per lb. for ton lots. GLASGOW: 5d. to 5½d. ex store. MANCHESTER: 4d. to 4½d.  
**SODIUM SILICATE.**—£9 10s. per ton.  
**SODIUM SULPHATE (GLAUBER SALTS).**—£3 per ton d/d.  
**SODIUM SULPHATE (SALT CAKE).**—Unground spot, £3 12s. 6d. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 12s. 6d.  
**SODIUM SULPHIDE.**—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.  
**SODIUM SULPHITE.**—Pew crystals, spot, £13 5s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.  
**SULPHATE OF COPPER.**—£20 per ton, less 2%, in casks. MANCHESTER: £22 5s. per ton f.o.b. SCOTLAND: £24 per ton less 5%, Liverpool, in casks.  
**SULPHUR PRECIP.**—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.  
**ZINC SULPHATE.**—Crystals, £9 per ton, f.o.r., in bags.

### Rubber Chemicals

**ANTIMONY SULPHIDE.**—Golden, 6½d. to 1s. 1d. per lb., according to quality. Crimson, 1s. 5½d. to 1s. 7d. per lb., according to quality.  
**ARSENIC SULPHIDE.**—Yellow, 1s. 5d. to 1s. 7d. per lb.  
**BARYTES.**—£6 to £7 10s. per ton, according to quality  
**CADMIUM SULPHIDE.**—7s. 8d. to 7s. 11d. per lb.  
**CARBON BISULPHIDE.**—£31 to £33 per ton, according to quantity, drums extra.  
**CARBON BLACK.**—3 11/16d. to 4 13/16d. per lb., ex wharf.  
**CARBON TETRACHLORIDE.**—£41 to £46 per ton, according to quantity, drums extra.  
**CHROMIUM OXIDE.**—Green, 1s. 2d. per lb.  
**DIPHENYLGUANIDINE.**—2s. 2d. per lb.  
**INDIA-RUBBER SUBSTITUTES.**—White, 4½d. to 5d. per lb.; dark, 3½d. to 4½d. per lb.  
**LAMP BLACK.**—£22 to £23 per ton d/d London; vegetable black, £28 to £48.  
**LEAD HYPOSULPHITE.**—9d. per lb.  
**LITHOPONE.**—30%, £16 10s. to £17 5s. per ton.  
**SULPHUR.**—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.  
**SULPHUR CHLORIDE.**—5d. to 7d. per lb., according to quantity.  
**VERMILION.**—Pale, or deep, 5s. 3d. per lb., 1-cwt. lots.  
**ZINC SULPHIDE.**—10d. to 11d. per lb., according to quality.

### Nitrogen Fertilisers

**SULPHATE OF AMMONIA.**—Neutral quality, basis 20.6 per cent. nitrogen, delivered in 6-ton lots to farmer's nearest station, £7 5s. per ton in 1 ton lots, £7 15s. per ton.  
**CALCIUM CYANAMIDE.**—£7 5s. per ton, carriage paid to any railway station in Great Britain in lots of four tons and over.  
**NITRO-CHALK.**—£7 5s. per ton for delivery to end of July.  
**NITRATE OF SODA.**—£7 12s. 6d. per ton for delivery up to end of July.  
**CONCENTRATED COMPLETE FERTILISERS.**—£10 12s. to £11 1s. per ton delivered in 6-ton lots to farmer's nearest station.  
**AMMONIUM PHOSPHATE FERTILISERS.**—£10 5s. to £13 15s. per ton for delivery up to end of July, delivered in 6-ton lots to farmer's nearest station.

### Coal Tar Products

**ACID, CRESYLIC.**—97/99%, 5s. 3d. to 5s. 6d. per gal.; 99/100%, 5s. to 6s., according to specification; pale 99%, 5s. 6d. to 5s. 8d.; dark, 4s. 8d. to 4s. 10d. GLASGOW: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale 97/99%, 4s. 6d. to 4s. 10d.; dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. 4d. to 2s. 6d. American specification, 4s. 3d. to 4s. 6d. MANCHESTER: Pale, 99/100%, 4s. 10d.  
**ACID, CARBOLIC.**—Crystals, 7½d. to 8½d. per lb.; crude, 60's, 4s. 3d. to 4s. 6d. per gal. MANCHESTER: Crystals, 9d. per lb. f.o.b. in drums; crude, 3s. 11d. per gal. GLASGOW: Crude, 60's, 4s. 3d. to 4s. 6d. per gal.; distilled, 60's, 4s. 4d. to 4s. 8d.  
**BENZOL.**—At works. crude, 10d. to 10½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d.; pure, 1s. 8½d. to 1s. 9d. GLASGOW: Crude, 10½d. to 10¾d. per gal.; motor, 1s. 4½d. to 1s. 5d.  
**CREOSOTE.**—B.S.I. Specification standard, 6d. per gal. f.o.r. Home, 3½d. d/d. LONDON: 4½d. f.o.r. North: 5d. London. MANCHESTER: 5½d. to 6½d. GLASGOW: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5½d. to 5¾d.  
**NAPHTHA.**—Solvent, 90/160%, 1s. 7d. to 1s. 8d. per gal.; 95/160%, 1s. 8d. to 1s. 9d.; 90/190%, 1s. 2d. to 1s. 3d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. GLASGOW: Crude, 6d. to 6½d. per gal.; 90% 160, 1s. 7d. to 1s. 8d., 90% 190, 1s. 2d. to 1s. 3d.

**NAPHTHALENE.**—Crude, whizzed or hot pressed, £10 to £11 per ton; purified crystals, £18 to £20 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 to £5 10s. per ton; crystals, £27 to £27 10s. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined, £21 per ton f.o.b.

**PITCH.**—Medium, soft, 38s. per ton, in bulk at makers' works. MANCHESTER: 36s. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

**PYRIDINE.**—90/140%, 9s. to 10s. per gal.; 90/180, 2s. 9d. to 3s. 6d. GLASGOW: 90% 140, 9s. to 10s. per gal.; 90% 160, 7s. to 8s.; 90% 180, 2s. 6d. to 3s. MANCHESTER: 9s. to 10s. at works.

**TOLUOLE.**—90%, 2s. per gal.; pure, 2s. 6d. GLASGOW: 90%, 120, 1s. 11d. to 2s. per gal.

**XYLOL.**—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. GLASGOW: Commercial, 2s. to 2s. 1d. per gal.

### Wood Distillation Products

**ACETATE OF LIME.**—Brown, £8 5s. to £8 15s. per ton; grey, £10 10s. to £11 10s. Liqueur, brown, 30° Tw., 6d. to 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11 10s.

**CHARCOAL.**—£6 5s. to £12 per ton, according to grade and locality.

**METHYL ACETONE.**—40-50%, £42 to £45 per ton.

**WOOD CREOSOTE.**—Unrefined 6d. to 1s. per gal., according to boiling range.

**WOOD, NAPHTHA, MISCIBLE.**—2s. 9d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.

**WOOD TAR.**—£3 to £4 per ton.

### Intermediates and Dyes

**ACID, BENZOIC, 1914 B.P. (ex toluol).**—1s. 9½d. per lb. d/d buyer's works.

**ACID, GAMMA.**—Spot, 4s. per lb. 100% d/d buyer's works.

**ACID, H.**—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

**ACID NAPHTHONIC.**—1s. 8d. per lb.

**ACID, NEVILLE AND WINTHER.**—Spot, 3s. per lb. 100%.

**ACID, SULPHANILIC.**—Spot, 8d. per lb. 100%, d/d buyer's works

**ANILINE OIL.**—Spot, 8d. per lb., drums extra, d/d buyer's works

**ANILINE SALTS.**—Spot, 8d. per lb. d/d buyer's works, casks free

**BENZIDINE, HCL.**—2s. 5d. per lb., 100% as base, in casks.

**m-CRESOL 98/100%.**—1s. 8d. to 1s. 9d. per lb. in ton lots.

**o-CRESOL 30/31° C.**—6½d. to 7½d. per lb. in 1-ton lots.

**p-CRESOL 34-5° C.**—1s. 7d. to 1s. 8d. per lb. in ton lots.

**DICHLORANILINE.**—1s. 11½d. to 2s. 3d. per lb.

**DIMETHYLANILINE.**—Spot, 1s. 6d. per lb., package extra.

**DINITROBENZENE.**—7½d. per lb.

**DINITROCHLOROBENZENE, SOLID.**—£72 per ton.

**DINITROTOLUENE.**—48/50° C., 8½d. per lb.; 66/68° C., 10d.

**DIPHENYLAMINE.**—Spot, 2s. per lb., d/d buyer's works.

**α-NAPHTHOL.**—Spot, 2s. 4d. per lb., d/d buyer's works

**β-NAPHTHOL.**—9½d. to 9¾d. per lb.; flake, 9½d. to 9¾d.

**α-NAPHTHYLAMINE.**—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.

**β-NAPHTHYLAMINE.**—Spot, 2s. 9d. per lb., d/d buyer's works in casks.

**o-NITRANILINE.**—3s. 11d. per lb.

**m-NITRANILINE.**—Spot, 2s. 7d. per lb., d/d buyer's works.

**p-NITRANILINE.**—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.

**NITROBENZENE.**—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

**NITRONAPHTHALENE.**—9d. per lb.; P.G., 1s. 0½d. per lb.

**SODIUM NAPHTHONATE.**—Spot, 1s. 9d. per lb., 100% d/d buyer's works.

**o-TOLUIDINE.**—10½d. per lb., in 8/10-cwt. drums, drums extra.

**p-TOLUIDINE.**—1s. 10½d. per lb., in casks.

**m-XYLIDINE ACETATE.**—4s. 3d. per lb., 100%.

### Latest Oil Prices

LONDON, July 28.—LINSEED OIL was firmer. Spot, £32 10s. per ton (small quantities), Aug., £30; Sept.-Dec., £29 17s. 6d.; Jan.-April, £30; May-Aug., £30 5s., naked. SOYA BEAN OIL was quiet. Oriental (bulk), afloat, Rotterdam, £25 per ton. RAPE OIL was quiet. Crude extracted, £37 per ton; technical refined, £38, naked, ex wharf. COTTON OIL was steady. Egyptian crude, £28 per ton; refined common edible, £31 15s.; deodorised, £33 15s.; naked, ex mill (small lots £1 10s. extra). TURPENTINE was slow. American, spot, 36s. per cwt.

HULL.—LINSEED OIL.—Spot quoted £30 10s. per ton; July and Aug., £30; Sept.-Dec., £29 17s. 6d.; Jan.-April, £29 17s. 6d. COTTON OIL.—Egyptian crude, spot, £28 per ton; edible refined, spot, £31; technical, spot, £31; deodorised, £33, naked. PALM KERNEL OIL.—F.m.q., spot, £25 10s. per ton. GROUND-NUIT OIL.—Extracted, spot, £32 per ton; deodorised, £35. RAPE OIL.—Extracted, spot, £36 per ton; refined, £37. SOYA BEAN OIL.—Extracted, spot, £32 per ton; deodorised, £33. COD OIL.—F.o.r. or f.a.s., 27s. 6d. per cwt. in barrels. CASTOR OIL.—Pharmaceutical, 44s. 6d. per cwt.; first, 39s. 6d.; second, 37s. 6d. TURPENTINE.—American, spot, 38s. 6d. per cwt.



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